



CREATING THE BEST WELDING EXPERIENCE



Welding Consumables

(Version: Abridged)



Edition: ADOR INDIA 2023



This is the Welding Consumables
Brochure (Abridged Version).
For the Comprehensive Version,
please write to us at cmo@adorians.com



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Arc Welding - Process Overview

(Data based on standard Industrial practices)

S.N.	Key Features	MMAW (Manual Metal Arc Welding)	GMAW (Gas Metal Arc Welding)	FCAW (Flux-Cored Arc Welding)	GTAW (Gas Tungsten Arc Welding)	SAW (Submerged Arc Welding)
	Common dia/∅ of consumable, mm	2.5, 3.15, 4.0 , 5.0	1.2 , 1.6	1.2 , 1.6	2.4 , 3.2	1.6, 3.15, 4.0
1	Cost of welding equipment	Low	Medium	Medium	Medium	High
2	Cost of welding consumable	Medium	Medium	Medium to High	High	Medium
3	Availability of welding consumable	Easy	Medium	Medium	Medium	Medium
4	Requirement of skill for welder	Less	Medium	High	V. High	Medium
5	Ease of using the welding process	Easy	Medium	Medium	Difficult	Medium
6	Suitability in welding positions	All	F, H, VU	All	All	F, H
7	On-sight welding	Easy	Medium	Medium	Medium	Difficult
8	Continuity in welding	Less	High	High	Less	Higher
9	Welding speed, mm/minute(The speed at which welding is done.)	140	200	200	Slowest	500
10	Deposition efficiency, % (Weight ratio of weld metal & consumable)	65	90	85	100	100
11	Effective arcing time, % (% of time spent on actual welding.)	35	45	45	Not Applicable	50
12	Arcing time/ 8 hrs shift, hour (Actual welding time in 8 hrs shift.)	2.8	3.6	3.6	Not Applicable	4.0
13	Deposition rate, kg/ hr (Weight of weld metal deposited/hr.)	1.5	3.4	3.5	Not Applicable	7.0
14	Deposition/ 8 hrs shift, kg (Actual weld metal deposited in 8 hrs shift)	4.2	12.24	12.6	Not Applicable	28.0
15	Ease to increase deposition rate	Only increasing dia/∅	Using Ar-CO2 gas	Using Ar-CO2 gas	Not Applicable	Using multi-wire

Notes: (All position welding means suitable to weld F: Flat, H: Horizontal, OH: Overhead, VD: Vertical down, VU: Vertical up – in all these positions)



Welding Electrodes

Section I



SUPERBOND

MILD STEEL GENERAL PURPOSE (MSGP)

AWS A/SFA 5.1 **E6013**

CLASSIFICATION:

ISO 2560-A

E38 0 R 1 1

IS 814

ER 4212

KEY FEATURES:

- Rutile coated
- Suitable for general purpose structural steels
- All position operating characteristics
- X-ray quality weld deposit

APPROVALS: ABS/DNV/BV/IRS/LRA/BIS/IBR/CE

TYPICAL APPLICATIONS:

- Steel structures
- Tanks
- Truck frames and bodies
- Ships, Pipelines
- Bridges
- Joining ASTM SA 283 Gr.A/B/C/D



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.1	0.45	0.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS, MPa	EL%	CVN Impact at 0°C, J
Typical	As Welded	500	430	25	68
Specification		430 min	330 min	17 min	47 min

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A	 AC (50 OCV min.)/ DCEN	All Positions 
2.5 x 350	60-90		
3.15 x 350	100-130		
3.15 x 450	100-130		
4.0 x 450	140-180		
5.0 x 450	180-240		

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.



SUPERBOND S

MILD STEEL GENERAL PURPOSE (MSGP)

AWS A/SFA 5.1 **E6013**

CLASSIFICATION:

ISO 2560-A

E38 0 R 1 2

IS 814

ER 4222X

KEY FEATURES:

- Rutile type medium coated
- Outstanding welding characteristics
- X-ray quality weld deposit
- All position capability

APPROVALS: ABS/IRS/LRA/IBR/CE

TYPICAL APPLICATIONS:

- Boiler tubes
- Storage tanks
- Railway wagons
- Shipbuilding, Bridges
- Pressure vessels
- Joining steels like - ASTM SA 36/36M, SA 283/283M Gr.A/B/C/D, SA 285/285M Gr.A/B/C, SA 414/414M Gr.A/B



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.06	0.5	0.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at 0°C, J
Typical	As Welded	510	440	25	70
Specification		430 min	330 min	17 min	47 min

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A		
1.6 x 250	30-50	 AC (50 OCV min.)/ DCEN	
2.0 x 300	40-60		
2.5 x 350	60-90		
3.15 x 350	100-140		
3.15 x 450	100-140		
4.0 x 450	140-190		
5.0 x 450	180-250		

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.



SUPERBOND SS

MILD STEEL GENERAL PURPOSE (MSGP)

AWS A/SFA 5.1 **E6013**

CLASSIFICATION:

ISO 2560-A

E38 0 RR 1 3

IS 814

ERR 4222X

KEY FEATURES:

- Rutile based heavy coated
- Touch type electrode
- X-ray quality weld deposit
- Suitable for major structural work and bridging wide root gap

APPROVALS: ABS/LRA/BIS/IRS/CE

TYPICAL APPLICATIONS:

- Pressure vessels, Storage tanks
- Locomotive fireboxes, Boilers
- Railway coach panels
- Fine steel furniture
- Automobile bodies
- Joining steels like - ASTM SA 36/36M
SA 283/283M Gr.A/B/C/D, SA285/285M
Gr.A/B/C, SA 414/414M Gr.A/B



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.06	0.45	0.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at 0°C, J
Typical	As Welded	515	445	25	65
Specification		430 min	330 min	17 min	47 min

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A		
2.5 x 350	60-90	 AC (50 OCV min.)/ DCEN	All Positions Except Vertical Down 
3.15 x 350	100-140		
3.15 x 450	100-140		
4.0 x 450	140-190		
5.0 x 450	190-250		

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.



KINGBOND S

MILD STEEL GENERAL PURPOSE (MSGP)

AWS A/SFA 5.1 **E6013**

CLASSIFICATION:

ISO 2560-A
E38 0 RC 1 1

IS 814
ER 4211X

KEY FEATURES:

- Rutile type coating
- Superior welding characteristics
- All position welding capability
- Radiographic weld quality

APPROVALS: BIS

TYPICAL APPLICATIONS:

- General purpose fabrication
- Sheet metal work
- Light construction work
- Steel furniture



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.1	0.35	0.35

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at 0°C, J
Specification	As Welded	430 min	330 min	17 min	55

PARAMETERS - PACKING DATA:

Ø x L, mm 2.50 x 300 3.15 x 350 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 60-85 90-130 90-130 140-180 180-240	 AC (50OCV)/DCEN/DCEP	All Positions 
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Available in Standard carton packing of 16-20 kg box containing 6 cartons. Contact for size-wise packing details.



METALBOND

MILD STEEL GENERAL PURPOSE (MSGP)

AWS A/SFA 5.1 **E6013**

CLASSIFICATION:

ISO 2560-A

E38 0 R 1 2

IS 814

ER 4112X

KEY FEATURES:

- Rutile type medium coated
- Operates at low OCV
- X-ray quality weld deposit
- All position welding capability
- Suitable for mild steel structural work

APPROVALS: ABS/BV/DNV/IRS/LRA/BIS/IBR/NTPC/BHEL/CE

TYPICAL APPLICATIONS:

- Storage tanks, Pipes
- Machine frames
- Construction equipment
- Welding steel grade IS 2062, 226



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.09	0.4	0.25

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at 0°C, J
Typical	As Welded	510	430	25	55
Specification		430 min	330 min	17 min	50 min.

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A		
2.5 x 350	60-80	 AC (50OCV min.)/ DCEN	All Positions 
3.15 x 350	100-130		
3.15 x 450	100-130		
4.0 x 450	140-180		

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.



SUPABASE

C-Mn STEEL (Low Hydrogen)

AWS A/SFA 5.1 **E7018**

CLASSIFICATION:

ISO 2560-A
E 42 3 B32 H5

IS 814
EB5426H₃JX

KEY FEATURES:

- Basic type iron powder electrode
- Metal recovery approx. 115%
- All position capability
- Radiographic weld deposit
- Suitable for pipe welding in 5G & 6G positions

APPROVALS: ABS/BV/LRA/IBR/BIS/NTPC/BHEL/CE

TYPICAL APPLICATIONS:

- Pressure vessels, Pipes
- Storage tanks
- Bridges, Heavy structures
- Joining steel of ASTM SA 414/414M Gr.C/D, SA 516/516M Gr.55/60, IS 2002, IS 2062

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.06	1.1	0.4



MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact
					-30°C, J
Typical	As Welded	540	470	26	60
Specification		490 min	400 min	22 min	47 min

Hardness, 3 Layer: 200BHN max

Diffusible H2 Content: <5 ml/100 gm

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 350 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 60-90 100-130 100-130 140-180 180-240	 AC (70 OCV)/ DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions Except Vertical Down 

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
			Flux	Wire
Automig I	Tigfil 70S-2	Automig FC 71T-5	Automelt B71	Automelt EM12K
Automig 70S-3	Tigfil 70S-3	-	Automelt B31	Automelt EH14
-	Tigfil 70S-6	-	-	-



SUPABASE X PLUS

C-Mn STEEL (Low Hydrogen)

AWS A/SFA 5.1 E7018 H4R

CLASSIFICATION:

ISO 2560-A

E 42 3 B 32 H5

IS 814

EB5426H₃JX

KEY FEATURES:

- Basic coated electrode
- Low hydrogen iron powder type
- Medium penetration
- High deposition rate
- Radiographic weld quality
- All position capability

APPROVALS: ABS/BV/DNV/IRS/LRA/NPCIL/BIS/CE

TYPICAL APPLICATIONS:

- Boilers, Pressure vessels
- Ship building, Storage tanks
- Heavy structures subject to dynamic loading
- Bridges, Pipe lines, Penstocks
- Joining IS 2002, 2062 steels

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.05	1.1	0.5

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact
					-30°C, J
Typical	As Welded	555	480	26	60
Specification		490 min	400 min	22 min	47 min

Hardness, 3 Layer: 200 BHN max

Diffusible H2 Content: <5 ml/100 gm

Special Test: HIC & SSCC (NACE)

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A	 AC (70 OCV)/ DCEP	All Positions Except Vertical Down
2.5 x 350	60-90		
3.15 x 350	100-130	REDRYING CONDITION: 250-300°C for minimum 1 hr.	
3.15 x 450	100-130		
4.0 x 450	140-180		
5.0 x 450	180-240		

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
			Flux	Wire
Automig I	Tigfil 70S-2	Automig FC 71T-5	Automelt B71	Automelt EM12K
Automig 70S-3	Tigfil 70S-3	-	Automelt B31	Automelt EH14
-	Tigfil 70S-6	-	-	-



TENALLOY Z PLUS

C-Mn STEEL (Low Hydrogen)

AWS A/SFA 5.1 E7018-1 H4R

CLASSIFICATION:

EN ISO 2560-A

E 42 4 B 32 H5

IS 814

EB5629H₃JX

KEY FEATURES:

- Basic coated iron powder type
- Suitable for pipe welding in 5G, 6G & 6GR positions
- Excellent toughness down to -50°C
- Radiographic weld deposit
- All position capability

APPROVALS: ABS/BV/DNV/IRS/LRA/NPCIL/BHEL/NTPC/BIS/CE

TYPICAL APPLICATIONS:

- Storage tanks, pipes, boilers
- Bridges & heavy structures subject to dynamic loading
- Joining ASTM SA 414/414M Gr.C/D, SA 516/516M Gr.55/60, IS 2002, IS 2062 steels

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.06	1.5	0.3

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -46°C, J
Typical	As Welded	560	480	27	60
Specification		490 min	400 min	22 min	50 min

Hardness (3 Layer): 200 BHN max

Diffusible H₂ Content: <5 ml/100 gm

Special Test: HIC & SSCC (NACE)

PARAMETERS - PACKING DATA:

Ø x L, mm

2.5 x 350

3.15 x 350

3.15 x 450

4.0 x 450

5.0 x 450

Amperage, A

60-90

90-140

90-140

140-180

180-240



AC (70 OCV)/ DCEP

REDRYING CONDITION:

250-300°C for minimum 1 hr.

All Positions, Except Vertical Down



Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing

EQUIVALENT:

GTAW	FCAW	SAW	
		Flux	Wire
Tigfil 70S-2 SPL	Automig FC 71T-5	Automelt B20 Plus	Automelt EH12K
Tigfil 70S-3	-	Automelt B41	Automelt EH10K
Tigfil 70S-6	-	Automelt B41	Automelt EH14



TENALLOY 16

C-Mn STEEL (Low Hydrogen)

AWS A/SFA 5.1 **E7016**

CLASSIFICATION:

ISO 2560-A

E 42 3 B 12 H5

IS 814

EB5426H₃X

KEY FEATURES:

- Basic coated low hydrogen electrode
- Ductile weld metal provide superior crack resistance
- All position capability
- Excellent impact properties down to -30°C
- Radiographic weld deposit

APPROVALS: ABS/DNV/IRS/LRA/IBR/CE/RDSO

TYPICAL APPLICATIONS:

- Buffer layer before hard facing
- Joining cast iron to mild steel
- Repair of cast iron
- Butt welding of rail ends
- Fixing of rails to mild steel girders

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si
0.06	1.2	0.6

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact, J
					-30°C
Typical	As Welded	560	475	27	60
Specification		490 min	400 min	22 min	50 min

Hardness (3 Layer): 200 BHN max.

Diffusible H2 Content: <5 ml/100 gm

PARAMETERS - PACKING DATA:

Ø x L, mm

2.5 x 350

3.15 x 350

3.15 x 450

4.0 x 450

5.0 x 450

Amperage, A

60-80

90-120

90-120

130-170

180-230



DCEP

REDRYING CONDITION:

250-300°C for minimum 1 hr.

All Positions, Except Vertical Down



Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing



CELWEL 60

CELLULOSIC

AWS A/SFA 5.1 **E6010**

CLASSIFICATION:

ISO 2560-A

E 38 3 C 21

IS 814

E C 4210 X

KEY FEATURES:

- Cellulose coated electrode
- Exhibits deep penetration and fast freezing
- All position operating characteristics
- Ideal for root pass and capping runs
- Radiographic quality welding

APPROVALS: ABS/LRA/IBR/CE

TYPICAL APPLICATIONS:

- Cross country pipelines subject to dynamic loading and mechanical restraint
- Suitable for sour gas pipes
- Suitable for steel grades ASTM A106 Gr. A/B, API 5L X42 and for root pass of X56

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si
0.15	0.5	0.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact, J
					at -30°C
Typical	As Welded	525	410	26	55
Specification		430 min	330 min	22 min	47 min

Hardness (3 Layer): 200 BHN max

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A		
2.5 x 350	50-90	 DCEP	All Positions, specifically in vertical down 
3.15 x 350	80-140		
4.0 x 350	120-180		
5.0 x 350	160-200		

Available in Standard carton packing of 18 kg box containing 3 tins of 6 kg each.



MOLYTEN

LOW ALLOY STEEL (High Temperature)

AWS A/SFA 5.5 **E7018-A1**

CLASSIFICATION:

EN ISO 3580-A

E Mo B 32 H5

IS 1395

E49B-A1

KEY FEATURES:

- Basic coated electrode
- Good creep rupture strength at elevated temperature up to 550°C
- High recovery electrode
- Preheat and PWHT at 620°C is required
- Radiographic quality welds
- All position capability

APPROVALS: ABS/IBR/NPCIL/BHEL/NTPC/CE

TYPICAL APPLICATIONS:

- Welding 0.5 Mo and 1 Cr - 0.5 Mo steels and similar composition steels
- High temperature and high pressure boilers
- Chemical industries, Oil refining industries, Turbine casting
- Suitable for 15Mo3, 16Mo3, 14Mo6
- Joining ASTM SA 182/182M Gr.F1, SA 204/204M Gr.A, SA 209/209M Gr.T1/T1A/T1B, SA 217/217M Gr.WCI

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Mo
0.06	0.7	0.4	0.5



MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at 0°C, J
Typical	PWHT: 620°C	550	460	27	80
Specification	for 1 hr.	490 min.	400 min	22 min	-

Hardness (3 Layer): 220 BHN max

Diffusible H₂ Content: <5 ml/100 gm

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 50-80 90-130 130-110 180-240	 AC (70 OCV)/DCEP	All Positions, except Vertical Down
		REDRYING CONDITION: 250-300°C for minimum 1 hr.	

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing

EQUIVALENT:

GMAW	GTAW	SAW	
		Flux	Wire
Automig 70S-A1	Tigfil 70S-A1	Automet B71	Automet EA2



CROMOTEN

LOW ALLOY STEEL (High Temperature)

AWS A/SFA 5.5 **E8018-B2**

CLASSIFICATION:

EN ISO 3580-A

E CrMo1 B 32 H5

IS 1395

E 55B-B2

KEY FEATURES:

- Basic coated iron powder electrode
- 1.25Cr-0.5Mo type weld deposit
- Resistant to creep and heat upto 550°C
- Preheat and interpass temperature of 150-200°C followed by PWHT
- Radiographic quality weld deposit
- Positional welding capability

APPROVALS: ABS/IBR/NPCIL/BHEL/NTPC/BIS/CE

TYPICAL APPLICATIONS:

- Welding of 1.25Cr-0.5Mo, 1Cr-0.5Mo steels in refineries, power plants, chemical plants
- Pressure vessels and Boilers
- Cr and Cr-Mo bearing steels at elevated temperature service e.g. steam production plants, steam pipes
- Joining P4 materials e.g. ASTM SA 182/182M Gr.F2/F11/F12, SA 213/213M Gr.T11/T12, SA 335/335M Gr.P11/P12, SA 387/387M Gr.2/11/12
- Suitable for 13CrMo44, 15CrMo5, 15Cr3, 16MnCr5, 20MnCr5

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Mo
0.06	0.7	0.6	1.3	0.5

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at 27°C, J
Typical	PWHT: 690°C	615	525	24	70
Specification	for 1 hr.	550 min	460 min	19 min	-

Diffusible H2 Content: <5 ml/100 gm

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 60-90 100-140 140-180 190-250	 AC (70 OCV)/DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
Automig 80S-B2	Tigfil 80S-B2	Automig FC81T1-B2	Flux	Wire
			Automelt B20 Plus	Automelt EB2



CROMOTEN C

LOW ALLOY STEEL (High Temperature)

AWS A/SFA 5.5 **E9018-B3**

CLASSIFICATION:

EN ISO 3580-A

E CrMo2 B 32 H5

KEY FEATURES:

- Basic coated
- Low alloy steel Cr-Mo deposit
- Resistant to creep and heat upto 600°C
- Ductile and crack resistant and heat treatable weld
- Radiography quality weld metal

APPROVALS: ABS/IBR/NPCIL/NTPC/CE

TYPICAL APPLICATIONS:

- Welding of 2.25Cr-0.5Mo and 2.25Cr-1Mo type creep resistant steels
- Cr-Mo and Cr-Mo-V bearing steels for high temperature applications
- Main steam pipes of boilers in electric power plant, Boiler super heaters
- Joining of P5A materials
- Suitable for 12CrMo9-10, 10CrSiMoV7 German steels
- Joining ASTM A 335 Gr.P22, A 387 Gr.22 materials
- Application in refineries, power plants, pressure vessels, boilers

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Mo
0.08	0.6	0.4	2.3	0.95

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Typical	PWHT: 690°C	660	580	22
Specification	for 1 hr.	620 min	530 min	17 min

Hardness, 3 Layer: 220 BHN max

Diffusible H2 Content: <5 ml/100 gm

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A
2.5 x 350	60-90
3.15 x 450	100-140
4.0 x 450	140-180
5.0 x 450	190-250



AC (70 OCV)/DCEP

All Positions, except vertical Down



REDRYING CONDITION:

250-300°C for minimum 1 hr.

Available in Standard carton packing of 20 kg box containing 4 cartons each. Also available in vacuum packing

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
			Flux	Wire
Automig 90S-B3	Tigfil 90S-B3	Automig FC 91T1-B3	Automelt B20 Plus	Automelt EB3



TENALLOY 55

LOW ALLOY STEEL (Low Temperature)

AWS A/SFA 5.5 **E8018-G**

CLASSIFICATION:

EN ISO 2560-A

E 46 5 1Ni B 12 H5

KEY FEATURES:

- Basic coated electrode
- Excellent fracture toughness down to -50°C
- Resist atmospheric corrosion
- Weld metal is tough & highly crack resistant
- Radiographic quality weld
- Suitable for positional welding

APPROVALS: IBR/CE

TYPICAL APPLICATIONS:

- Suitable for joining steels containing 1% Ni and 0.5% Cu
- Storage tanks, Pipes
- Pressure vessels, Boilers
- Bridges, Heavy structures

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Ni
0.07	1.35	0.3	0.9

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -50°C, J
Typical	As Welded	610	570	25	55
Specification		550 min	460 min	19 min	47 min

Diffusible H2 Content: <5 ml/100 gm

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 60-90 100-140 140-180 190-250	 AC (70 OCV)/DCEP	All Positions, except vertical Down
		REDRYING CONDITION: 250-300°C for minimum 1 hr.	

Available in Standard carton packing of 20 kg box containing 4 cartons 5 kg each. Also available in vacuum packing



KINGSTEEL

STAINLESS STEEL (Austenitic Steel)

KEY FEATURES:

- Rutile type coating
- Excellent corrosion and scaling resistance
- Smooth and stable arc
- Minimal spatter
- Self peeling slag
- Excellent welder appeal
- Deposits 308L type of weld metal
- All position capability
- Radiographic quality welds

TYPICAL APPLICATIONS:

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- For Structural Welding applications



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni
0.03	1.5	0.8	18	9

MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	UTS, Mpa	EL%
As Welded	520 min	35 min

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 350 4.0 x 350	Amperage, A 50-75 80-100 110-140	 AC (50 OCV) / DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.



STRIKER 308L

STAINLESS STEEL (Austenitic Steel)

AWS A/SFA 5.4 E 308L-16

KEY FEATURES:

- Rutile type coating
- Excellent corrosion and scaling resistance
- Smooth and stable arc
- Minimal spatter
- Self peeling slag
- Excellent welder appeal
- All position capability
- Radiographic quality welds

TYPICAL APPLICATIONS:

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- For Structural Welding applications



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni
0.03	1.5	0.7	18.5	9.0

MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	UTS, Mpa	EL%
As Welded	520 min	35 min

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 350 4.0 x 350	Amperage, A 55-75 85-100 110-140	 AC (50 OCV) / DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.



SUPERINOX 1A

STAINLESS STEEL (Austenitic Steel)

AWS A/SFA 5.4 **E308-16**

CLASSIFICATION:

ISO 3581-A

E 19 9 R 12

IS 5206

E 19.9 R26

KEY FEATURES:

- Rutile based coating
- 19/10 type austenitic SS weld
- Resistant to cracking, corrosion and scaling upto 800°C
- Controlled ferrite content
- Smooth operating characteristics
- All position capability
- Radiographic weld quality

APPROVALS: - LRA/RDSO/IBR/CE

TYPICAL APPLICATIONS:

- Welding Cr-Ni steels represented by AISI 301, 302, 304 and 308
- Fabrication of boilers, reactors and turbines
- Suitable for material no. 1.4300, 1.4301, 1.4310, 1.4312, 1.4550, 1.4001, 1.4016, 1.4057
- Build up application on SS surfaces of centrifugal pump impellers and shafts valve faces, seats etc.
- SS piping in refineries, oil & gas industries, chemical plants



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni
0.04	1.0	0.5	20.1	9.7

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%	Ferrite No.
Typical	As Welded	600	40	5
Specification		550 min	30 min	3-8

PARAMETERS - PACKING DATA:

Ø x L, mm 2.0 x 300 2.5 x 350 3.15 x 350 4.0 x 350 5.0 x 350	Amperage, A 35-45 50-75 80-100 110-140 150-180	 AC (70 OCV) / DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 

Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.



SUPERINOX 1C

STAINLESS STEEL (Austenitic Steel)

AWS A/SFA 5.4 **E308L-16**

CLASSIFICATION:

ISO 3581-A
E 19 9 L R 12

IS 5206
E19.9 LR26

KEY FEATURES:

- Extra low carbon 19/10 type austenitic weld
- Excellent corrosion and scaling resistance upto 800°C
- Rutile based coating
- Suitable for all position welding
- Radiographic quality weld deposit
- Controlled ferrite content for maximum cracking resistance

APPROVALS: ABS/BV/IRS/NPCIL/IBR/CE

TYPICAL APPLICATIONS:

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- Fabrication of boilers, reactors and turbines
- Build up application on SS
- SS piping in refineries, oil and gas Industries, chemical plants
- Suitable for material no. 1.4300, 1.4301, 1.4310, 1.4312, 1.4550, 1.4001, 1.4016, 1.4057

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni
0.03	0.9	0.4	19.6	9.1

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%	Ferrite No.
Typical	As Welded	590	37	5
Specification		520 min	30 min	3-8

Special Tests: IGC Practice E/C of ASTM A262

PARAMETERS - PACKING DATA:

Ø x L, mm 2.0 x 300 2.5 x 350 3.15 x 350 4.0 x 350	Amperage, A 35-45 50-75 80-100 110-140	 AC (70 OCV) /DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
			Flux	Wire
Miginox 308L	Tiginox 308L	Miginox FC 308L	Automelt S33	Subinox 308L



SUPERINOX 1B

STAINLESS STEEL (Austenitic Steel)

AWS A/SFA 5.4 **E347-16**

CLASSIFICATION:

ISO 3581-A

E 19 9 Nb R 12

IS 5206

E19.9 Nb R26

KEY FEATURES:

- Rutile based coating
- Resistance to cracking and embrittlement
- Resistance to intergranular corrosion and scaling upto 850°C
- 19/10/Nb stabilized weld deposit
- Smooth operating characteristics
- All position capability
- Radiographic quality weld

APPROVALS: BV/IRS/IBR/CE

TYPICAL APPLICATIONS:

- Fabrication of equipments in refineries, power plants, centrifugal pump impellers and shafts, valve faces, seats
- Suitable for material no. 1.4300, 1.4301, 1.4306, 1.4308, 1.4310, 1.4541, 1.4543, 1.4550, 1.4552, 1.4878, 1.6905
- Fabrication of boiler and gas turbine paper and pulp, paint and dye industries
- Welding of stainless steel tanks, valves, pipes in food, chemical and petrochemical industries
- Welding stabilized Cr-Ni steels such as AISI 321, 321H, 347, 347H

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni	Nb
0.035	1.1	0.75	20.7	9.9	0.6

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%	Ferrite No.
Typical	As Welded	600	35	7
Specification		520 min	30 min	3-9

Special Tests: IGC Practice E of ASTM A262

PARAMETERS - PACKING DATA:

Ø x L, mm 2.0 x 300 2.5 x 350 3.15 x 350 4.0 x 350 5.0 x 300	Amperage, A 35-45 50-75 80-100 110-140 150-180	 AC (70 OCV) /DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
Miginox 347	Tiginox 347	Miginox FC 347	Flux	Wire
			Automelt S33	Subinox 347



SUPERINOX 2A

STAINLESS STEEL (Austenitic Steel)

AWS A/SFA 5.4 **E316-16**

CLASSIFICATION:

ISO 3581-A

E 19 12 2 R 12

IS 5206

E19.12.2 R26

KEY FEATURES:

- Rutile type coating
- 19/12/Mo SS electrode
- Offers improved corrosion and pitting resistance in marine and industrial environment
- Controlled ferrite content for maximum cracking resistance
- Excellent welder appeal
- All position capability
- Radiographic quality weld

APPROVALS: RDSO/IBR/CE

TYPICAL APPLICATIONS:

- Welding Mo bearing austenitic alloys represented by AISI 316, 317
- Suitable for material no. 1.4401 & similar grades
- Welding of equipments in Chemical, Paper and pulp, Paint and dye industries

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni	Mo
0.03	1.0	0.4	18.5	11.2	2.3

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%	Ferrite No.
Typical	As Welded	595	36	4
Specification		520 min	30 min	3-8

PARAMETERS - PACKING DATA:

Ø x L, mm

2.5 x 350

3.15 x 350

4.0 x 350

5.0 x 350

Amperage, A

50-75

80-100

110-140

150-180



AC (70 OCV) /DCEP

REDRYING CONDITION:

250-300°C for minimum 1 hr.

All Positions, except vertical Down



Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.



SUPERINOX 2C

STAINLESS STEEL (Austenitic Steel)

AWS A/SFA 5.4 **E316L-16**

CLASSIFICATION:

ISO 3581-A

E (19 12 3 L) R 12

IS 5206

E19.12.2 LR26

KEY FEATURES:

- Rutile type coating
- Extra low carbon 19/13/Mo type weld
- High resistance against intergranular corrosion
- Resistant to SCC, hot cracking & chemical attack
- upto 850°C
- Offers improved corrosion and pitting resistance in marine and industrial environment
- Suitable for all position
- Radiographic quality weld

APPROVALS: BV/IRS/NPCIL/IBR/CE

TYPICAL APPLICATIONS:

- Welding Mo bearing austenitic alloys represented by AISI 316, 316L, 317, 317L, 318 types
- Welding of equipments in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries
- Joining similar grade wrought and cast material
- Cladding stainless steels
- Suitable for material no. 1.4401, 1.4404, 1.4406, 1.4408, 1.4429, 1.4435, 1.4436, 1.4437, 1.4571, 1.4580, 1.4583

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni	Mo
0.03	0.85	0.4	18.5	11.2	2.3

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%	Ferrite No.
Typical	As Welded	565	35	4
Specification		490 min	30 min	3-8

Special Tests: IGC Practice E/C of ASTM A262

PARAMETERS - PACKING DATA:

Ø x L, mm 2.0 x 300 2.5 x 350 3.15 x 350 4.0 x 350	Amperage, A 35-45 50-75 80-100 110-140	 AC (70 OCV) /DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
			Flux	Wire
Miginox 316L	Tiginox 316L	Miginox FC 316L	Automelt S33	Subinox 316L



BETANOX D

STAINLESS STEEL (Dissimilar Steel Welding)

AWS A/SFA 5.4 **E309-16**

CLASSIFICATION:

ISO 3581-A
E (23 12) R 12

IS 5206
E 23.12 R26

KEY FEATURES:

- Rutile type medium coating
- 23/12 type SS deposit
- Exhibit excellent corrosion and oxidation resistance upto 1100°C
- Highest resistance to cracking
- Low dilution on mild and low alloy steels due to higher alloy content
- All position capability
- Radiographic quality weld

APPROVALS: LRA/IBR/CE

TYPICAL APPLICATIONS:

- Dissimilar joints between stainless steels and low alloy or carbon steels
- Welding of AISI 309 type steels
- Buffer layer on low alloy and carbon steels
- Joining corrosion resistant clad steels



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni
0.03	0.9	0.7	23.5	12.5

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	610	38
Specification		550 min	30 min

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 350 4.0 x 350	Amperage, A 50-75 80-100 110-140	 AC (70 OCV) /DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.



BETANOX DL

STAINLESS STEEL (Dissimilar Steel Welding)

AWS A/SFA 5.4 **E309L-16**

CLASSIFICATION:

ISO 3581-A
E 23 12L R 12

IS 5206
E 23.12 LR26

KEY FEATURES:

- Rutile type coating
- High ferrite content for highest resistance to cracking
- Low dilution on mild and low alloy steels due to higher alloy content
- Extra low carbon 23/12 type deposit
- Exhibit excellent corrosion and oxidation resistance upto 1100°C
- Suitable for all position
- Radiographic quality welds

APPROVALS: ABS/BV/IRS/NPCIL/IBR/CE

TYPICAL APPLICATIONS:

- Dissimilar joints between stainless steels and low alloy or carbon steels
- Welding of AISI 309, 309L type steels
- For buffer layer on low alloy and carbon steels
- Joining corrosion resistant clad steels


TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni
0.025	1.7	0.5	23.5	12.05

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	560	36
Specification		520 min	30 min

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A	 AC (70 OCV) /DCEP	All Positions, except vertical Down
2.5 x 350	50-75		
3.15 x 350	80-100		
4.0 x 350	110-140		
		REDRYING CONDITION: 250-300°C for minimum 1 hr.	

Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.

EQUIVALENT:

GMAW	GTAW	FCAW	SAW	
			Flux	Wire
Miginox 309L	Tiginox 309L	Miginox FC 309L	Automelt S33	Subinox 309L



BETANOX C

STAINLESS STEEL (Heat Resisting)

AWS A/SFA 5.4 **E310-16**

CLASSIFICATION:

ISO 3581-A

E 25 20 R 12

IS 5206

E 25.20 R26X

KEY FEATURES:

- Rutile coated electrode
- 25/20 type SS deposit
- Excellent resistance to cracking and fissuring
- Provides excellent stability and oxidation resistance upto 1150°C
- Excellent arc stability
- Low spatter loss
- Easy slag removal
- Suitable for all position
- Radiographic quality weld deposit

APPROVALS: CE

TYPICAL APPLICATIONS:

- Joining difficult to weld steels such as armor plates and ferritic stainless steels as well as dissimilar steels
- Furnace parts, Annealing boxes, Carburizing pots, Gas turbine combustion chamber parts, hydrogenation and polymerization plant
- Welding of AISI 310 and similar steel
- Cladding side of stainless steels and dissimilar steels
- Suitable for materials 1.4710, 1.4713, 1.4745, 1.4762, 1.4823, 1.4832, 1.4837, 1.4840, 1.4841, 1.4845, 1.4846, 1.4848, 1.4849



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni
0.11	1.5	0.5	27	20.5

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	600	37
Specification		550 min	30 min

PARAMETERS - PACKING DATA:

Ø x L, mm 2.5 x 350 3.15 x 350 4.0 x 350	Amperage, A 50-75 80-100 110-140	 AC (70 OCV) /DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.	All Positions, except vertical Down 
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Available in Standard carton packing of 10 kg box containing 5 cartons of 2 kg each.

EQUIVALENT:

GMAW	GTAW
Miginox 310	Tiginox 310



ZEDALLOY 350

HARD FACING (Moderate - Abrasion Impact)

ALLOY BASIS

C, Mn, Si, Cr

KEY FEATURES:

- Rutile coated electrode
- Air hardenable deposit
- Machinable with carbide tools
- High weld metal recovery
- Good combination of abrasion and impact properties
- Resistant to friction
- Recommended buffer layer of Tenalloy-16 on hard base materials

APPROVALS: RDSO

TYPICAL APPLICATIONS:

- Excavators, Conveyor parts
- Supporting rollers of Kiln tyres
- Wobbler ends, Cams
- Gear shafts
- Plough shares
- Shear blades
- Girth gears in cement and power plants





MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	3 Layer, Hardness, HRC (BHN), Typical
As Welded	35 (330)

PARAMETERS - PACKING DATA:

Ø x L, mm 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 100-140 140-180 180-220	 AC (70 V) / DCEN REDRYING CONDITION: 110°C for ½ hr.
--	---	--

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
			

Physical Properties: With increase in number of squares, property improves



ZEDALLOY 550

HARD FACING (Moderate - Abrasion Impact)

ALLOY BASIS

C, Mn, Si, Cr

KEY FEATURES:

- Rutile coated electrode
- Air hardenable deposit
- Non machinable
- Resistant to spalling and cracking
- Resistance against high stress abrasion and friction
- Can withstand moderate impact
- Recommended buffer layer of Tenalloy-16 on hard base materials

TYPICAL APPLICATIONS:

- Dis-integrator hammers
- Excavator teeth, Shear blades
- Bulldozer blades, Bucket lip
- Metal cutting and forming tools
- Crane wheels, Caterpillar treads
- Cane cutting knives




MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	3 Layer, Hardness, HRc (BHN), Typical
As Welded	56 (580)

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A	
3.15 x 450	100-130	 AC (70 V) / DCEN
4.0 x 450	140-180	
5.0 x 450	180-220	
		REDRYING CONDITION: 110°C for minimum ½ hr.

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
			

Physical Properties: With increase in number of squares, property improves



ZEDALLOY 550 LH

HARD FACING (Moderate - Abrasion Impact)

ALLOY BASIS

C, Mn, Si, Cr

KEY FEATURES:

- Basic type coating
- Air hardenable non machinable weld
- Recommended buffer layer of Tenalloy-16 on hard base materials
- Resistance against high stress abrasion and friction
- Can withstand moderate impact
- Resistant to spalling and cracking


TYPICAL APPLICATIONS:

- Crushers and hammers
- Excavator teeth
- Shear blades
- Metal to mineral wear application
- Crane wheels, Caterpillar treads
- Bulldozer blades, Bucket lip
- Bamboo chipper knives
- Dis-integrator hammers




MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	3 Layer, Hardness, HRC (BHN), Typical
As Welded	56 (580)

PARAMETERS - PACKING DATA:

Ø x L, mm 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 100-130 140-180 180-220	 AC (70 V) / DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.
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Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
			

Physical Properties: With increase in number of squares, property improves



ZEDALLOY 600

HARD FACING (Moderate - Abrasion Impact)

ALLOY BASIS

C, Mn, Si, Cr, Mo

KEY FEATURES:

- Rutile type heavy coating
- Extremely hard non machinable deposit
- Deposit can be finished by grinding
- High hardness in single layer
- Suitable for high carbon and high sulphur steels
- Can withstand mild impact

TYPICAL APPLICATIONS:

- Drilling bits, Punches, Dies
- Crane wheels, Shear blades
- Crushers, Hammers
- Paper cutting knives, Mine rails
- Oil expeller worms
- Conveyor parts




MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	1 Layer, Hardness, HRC (BHN), Typical
As Welded	58 (600)

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A	 AC (70 V) / DCEP
3.15 x 450	100-140	
4.0 x 450	140-180	
5.0 x 450	180-220	
REDRYING CONDITION: 110°C for minimum ½ hr.		

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each. Also available in vacuum packing

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
			

Physical Properties: With increase in number of squares, property improves



ZEDALLOY 12Mn

HARD FACING (High Impact - Work Hardenable)

ALLOY BASIS

C, Mn, Si

KEY FEATURES:

- Basic type coating
- Easily machinable
- Crack free and sound weld
- Recommended buffer layer of Betachrome-N on mild and low alloy steels
- Typical 12% Mn deposit
- Exhibit excellent work hardening characteristics under severe impact conditions
- Ideal for gouging type abrasion wear


TYPICAL APPLICATIONS:

- Rock crushing jaws
- Cement grinding rings
- Mn steel rails
- Suitable for build-up and cushioning
- Dredger bucket teeth
- Austenitic Mn steel castings
- Hammers
- Crusher mantles

MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	3 Layer, Hardness, HRC (BHN) Typical
As Welded	16 (200)
Work Hardened	52 (500)

PARAMETERS - PACKING DATA:

Ø x L, mm	Amperage, A	
3.15 x 450	100-140	 AC (70 V) / DCEP
4.0 x 450	140-180	
5.0 x 450	180-230	
6.3 x 450	230-290	
		REDRYING CONDITION: 250-300°C for minimum 1 hr.

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
			

Physical Properties: With increase in number of squares, property improves



ZEDALLOY VB

HARD FACING (High Abrasion)

ALLOY BASIS

C, Mn, Si, Cr

KEY FEATURES:

- Basic type coating
- Non machinable alloyed cast iron deposit
- Deposit surface does not deteriorate through furrowing, local plastic flow and micro cracking
- Weld deposit can withstand severe abrasion, moderate impact and metal to metal wear
- Resistant to scratching and grinding abrasion

TYPICAL APPLICATIONS:

- Concrete Mixer Blades
- Muller Tyres, Dippers
- Screw Conveyors
- Plough Shares
- Cement Die Rings
- Oil Expeller Worms
- Scraper Blades
- Excavator Teeth




MECHANICAL PROPERTIES OF ALL WELD METAL:

Condition	3 Layer, Hardness, HRC (BHN) Typical
As Welded	58 (600)

PARAMETERS - PACKING DATA:

Ø x L, mm 3.15 x 450 4.0 x 450 5.0 x 450	Amperage, A 90-110 110-140 140-180	 AC (70 V) / DCEP REDRYING CONDITION: 250-300°C for minimum 1 hr.
--	--	--

Available in Standard carton packing of 20 kg box containing 4 cartons of 5 kg each.

Machinability	Abrasion Resistance	Impact Resistance	Corrosion Resistance
			

Physical Properties: With increase in number of squares, property improves



Wires and Fluxes

Section II



AUTOMIG I

GMAW C-Mn Steel

AWS A/SFA 5.18 **ER70S-6**

CLASSIFICATION:

EN ISO 14341-A

CSA W48

G 42 3 C1 3Si1

B-G 49A 3C1 S6

G 46 4 M21 3Si1

G 46 4 M24 3Si1

IS 6419

S4-C 504

KEY FEATURES:

- C-Mn steel solid wire
- Uniform copper coating
- Smooth wire feeding
- Can be use with 100% CO₂, Ar+CO₂
- Higher level of de-oxidizers makes it suitable for applications where dirt, rust or mill-scale is present
- Radiographic quality weld

APPROVALS: ABS/BV/DNV/IRS/IBR/LRA/NPCIL/RDSO/CE/CWB/BIS

TYPICAL APPLICATIONS:

- Truck bodies, Storage tanks
- Construction equipment
- Light gauge work
- Steel furniture, Machinery
- Foundry equipment, Barges
- Tacking work, Small parts repair

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:

C	Mn	Si
0.075	1.45	0.85



MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	Shielding Gas	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact, J	
						@-30°C	@-50°C
Typical	As Welded	100% CO ₂	570	470	25	50	-
Typical	As Welded	80Ar + 20CO ₂	580	480	26	80	50

Special Test: HIC and SSCC (NACE)

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm	Net Wt., Kg	 DCEP STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box		All Positions 
0.8	15			
1.0	15			
1.2	15			
1.6	15			

Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	12-18	10-20
80Ar+20CO ₂	17-22	10-20

Available in Plastic Spool & Wire Basket. Also Available in 100, 150 & 250Kg Drums



TIGFIL 70S-2

GTAW C-Mn Steel

AWS A/SFA 5.18 **ER70S-2**

CLASSIFICATION:

EN ISO 636-A

W 42 3 2Ti

IS 6419

S4-I 504

KEY FEATURES:

- Triple deoxidized copper coated C-Mn steel filler rod
- High quality, high toughness welds
- Excellent choice for welding over rust and mill scale
- Radiographic quality weld

APPROVALS: ABS/DNV/LRA/NPCIL/IBR/CE

TYPICAL APPLICATIONS:

- Welding of Pressure vessel, Boilers involving unalloyed and micro-alloyed structural steels with specified UTS up to 520 Mpa
- High quality pipe welding of mild and medium tensile steels
- Best suited for single side, melt through welding

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:



C	Mn	Si	Ti	Zr	Al
0.055	1.1	0.45	0.08	0.04	0.08

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	560	470	26	65

Special Test: Hot Tensile Test at 196°C / HIC and SSCC (NACE)

PARAMETERS - PACKING DATA:

Ø x L, mm	Net Wt Kg/Box		
1.6 x 1000	20	 DCEN STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	 All Positions
2.0 x 1000	20		
2.4 x 1000	20		
3.15 x 1000	20		

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

Available in Standard carton packing of 20 kg box, containing 4 plastic tubes of 5 kg each.



TIGFIL 80S-B2

GTAW LOW ALLOY STEEL (High Temperature)

AWS A/SFA 5.28 **ER80S-B2**

CLASSIFICATION:

EN ISO 21952-B
W 55 I13 1CM

IS 6419
SLA-3-I-531

KEY FEATURES:

- Copper coated low alloy steel solid filler wire
- Uniform copper coating
- Deposit notch free welds with excellent mechanical properties
- Typical 1.25 Cr-0.5 Mo weld
- deposit
- Careful control of pre-heat, interpass temperature & PWHT is essential to avoid cracking
- Radiographic quality weld

APPROVALS: IBR/NTPC/CE

TYPICAL APPLICATIONS:

- Welding of 0.5Cr-0.5Mo, 1Cr-0.5Mo and 1.25Cr-0.5Mo steel pipes, plates and castings
- Elevated temperature and corrosive service applications in Refineries, Petrochemicals & fertilizers plant
- Can be used for joining dissimilar combinations of Cr-Mo and Carbon steels
- Suitable for ASTM A 199-76, A 200-75, A 213- 76D, A 335 Gr.P11, A 369-76, A 387 Gr.B, DIN 15CrMo3



TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:

C	Mn	Si	Cr	Mo
0.1	0.6	0.5	1.25	0.52

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Typical	PWHT: 620°C for 1 hr	620	530	22

PARAMETERS - PACKING DATA:

Ø x L, mm	Net Wt., Kg		
1.6 x 1000	20	 DCEN STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions 
2.0 x 1000	20		
2.4 x 1000	20		
3.15 x 1000	20		

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

Available in Standard carton packing of 20 kg box, containing 4 plastic tubes of 5 kg each.



TIGFIL 90S-B3

GTAW LOW ALLOY STEEL (High Temperature)

AWS A/SFA 5.28 **ER90S-B3**

CLASSIFICATION:

EN ISO 21952-B
W 62 11 2C1M

IS 6419
SLA-4-I-561

KEY FEATURES:

- Copper coated low alloy steel solid filler wire & rod
- Uniform copper coating
- Deposit notch free welds with excellent mechanical properties
- Typical 2.25 Cr-1 Mo weld deposit
- Superior strength and toughness after PWHT
- Radiographic quality weld

APPROVALS: IBR/NTPC/CE

TYPICAL APPLICATIONS:

- Welding of 2.25Cr-0.5Mo and 2.25Cr-1Mo type creep resistant steels
- Joining ASTM A 335 Gr.P22, A 387 Gr.22 materials
- Refineries, Petrochemicals and fertilizers plant
- Joining of P5A materials
- Cr-Mo and Cr-Mo-V bearing steels for hightemperature applications
- Suitable for 12CrMo9-10, 10CrSiMoV7 German steels

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:

C	Mn	Si	Cr	Mo
0.09	0.6	0.5	2.45	0.95



MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%
Typical	PWHT: 690°C for 1 hr	680	600	20

CREEP TEST DATA:

Condition	Temperature, °C	Stress, Mpa	Duration, Hrs	Strain% after 1000 Hrs
PWHT: 690°C for 1 Hr	550	140	1000	0.92
	600	80	1000	1.28

PARAMETERS - PACKING DATA:

Ø x L, mm 1.6 x 1000 2.0 x 1000 2.4 x 1000 3.15 x 1000	Net Wt., Kg 20 20 20 20	 DCEN STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions 
--	-------------------------------------	--	--

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

Available in Standard carton packing of 20 kg box, containing 4 plastic tubes of 5 kg each.



AUTOMIG 80S-D2

GMAW LOW ALLOY STEEL (High Strength)

AWS A/SFA 5.28 **ER80S-D2**

CLASSIFICATION:

EN ISO 16834-B

G 4M31

KEY FEATURES:

- Copper coated solid filler wire and rod
- Mn-0.5 Mo type welds deposit
- Uniform copper coating
- Mo Provide increased strength
- High levels of Mn and Si provide good wetting, rust and scale tolerance
- Excellent sub-zero toughness
- Porosity free radiographic quality weld

APPROVALS: CE

TYPICAL APPLICATIONS:

- Welding of Mn-0.5 Mo steel
- Application in oil process pipe work and fittings where resistance to sulphide-induced stress corrosion cracking is important
- Suitable for single and multiple pass welding
- Variety of ordinary and difficult to weld carbon and low alloy, higher strength steels in both as welded and PWHT condition

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:



C	Mn	Si	Mo
0.09	1.7	0.5	0.45

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	590	500	21	55

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm	Kg/Spool	 DCEP		All Positions
1.2	15	STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box		
1.6	15			

Shielding Gas	Gas Flow Rate, LPM
CO ₂	15-20



AUTOMIG 80S-G

GMAW LOW ALLOY STEEL (High Strength)

AWS A/SFA 5.28 **ER80S-G**

KEY FEATURES:

- Copper coated low alloy steel solid filler wire & rod
- Characterized by smooth and shiny welds
- Uniform copper coating
- Provide good wetting, rust and scale tolerance
- Weld deposit is resistant to cold cracking
- Recommended with 100% CO₂ shielding gas
- Radiographic quality even over poor cleaned base metals

APPROVALS: IBR/CE

TYPICAL APPLICATIONS:

- Welding of Mn-0.5 Mo steel
- Pipelines and pressure vessels with operating temperatures of about 500°C
- Repair of medium strength steel castings
- Suitable for a wide range of base metals such as problem steels containing high sulfur to the basic carbon and low alloy Cr-Mo base metals

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:



C	Mn	Si	Mo
0.09	1.7	0.6	0.4

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	600	540	24	50

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm 1.2 1.6	Kg/Spool 15 15	 DCEP	All Positions 
STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box			

Shielding Gas	Gas Flow Rate, LPM
CO ₂	15-20



AUTOMIG 90S-D2 (AUTOMIG IV)

AWS A/SFA 5.28 **ER90S-D2**

GMAW LOW ALLOY STEEL (High Strength)

KEY FEATURES:

- Copper coated solid filler wire and rod
- Mn-0.5 Mo type welds deposit
- Uniform copper coating
- Mo addition for high strength
- High level of deoxidizers for defect free welds
- Excellent low temperature toughness
- Porosity free radiographic quality weld

APPROVALS: IBR/RDSO/CE

TYPICAL APPLICATIONS:

- Welding of high tensile steels like IS 8500 Gr.540B,570B & 590B, IS 2002 Gr.3, IS 1875 Class 3A
- Welding of Sailma 450/450Hi steel used in CONCOR wagon
- Suitable for single and multiple pass welding
- High temperature service pipe, fittings, flanges and valves

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:



C	Mn	Si	Mo
0.09	1.7	0.5	0.45

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	640	580	20	50 min

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm 1.2 1.6	Kg/Spool 15 15	 DCEP	All Positions 
STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box			

Shielding Gas	Gas Flow Rate, LPM
Ar/1-5O ₂	15-20
80Ar + 20CO ₂	15-20



MIGINOX 308L

GMAW STAINLESS STEEL

AWS A/SFA 5.9 **ER308L**

CLASSIFICATION:

EN ISO 14343-A
G 19 9 L

IS 5856
ES 20.10 L

KEY FEATURES:

- An extra low carbon 308L type stainless steel solid wire
- Excellent crack resistance
- Excellent corrosion & scaling resistance up to 800°C
- Resistance to intergranular corrosion
- Radiographic quality welds

APPROVALS: RDSO/NPCIL/CE

TYPICAL APPLICATIONS:

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- SS piping in refineries, oil and gas industries, chemical plants, food processing industries
- Fabrication of boilers, reactors, turbines, pipes, tubes

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:



C	Mn	Si	Cr	Ni
0.027	1.7	0.4	19.7	9.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	570	39

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm 0.8 1.2 1.6	Kg/Spool 12.5 12.5 12.5	 DCEP STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions 
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Shielding Gas	Gas Flow Rate, LPM
98Ar + 2O ₂ or Ar/1-5CO ₂	15-20



MIGINOX 309L

GMAW STAINLESS STEEL

AWS A/SFA 5.9 **ER309L**

CLASSIFICATION:

EN ISO 14343-A
G 23 12 L

IS 5856
ES 24.13 L

KEY FEATURES:

- An extra low carbon 23Cr/12Ni type stainless steel wire
- Excellent corrosion and oxidation resistance up to 1100°C
- High ferrite content ensures highest cracking resistance
- Radiographic quality weld

APPROVALS: RDSO/CE

TYPICAL APPLICATIONS:

- Welding of AISI 309, 309L type steels
- Dissimilar joints between stainless steels and low alloy or carbon steels
- Buffer layer on low alloy and carbon steels
- Joining corrosion resistant clad steels

TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:



C	Mn	Si	Cr	Ni
0.027	1.9	0.4	23.5	12.3

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	590	40

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm	Kg/Spool	 DCEP	All Positions 
0.8	12.5		
1.2	12.5		
1.6	12.5		

STORAGE / HANDLING :
Keep dry and follow handling instructions mentioned on the box

Shielding Gas	Gas Flow Rate, LPM
98Ar/2O ₂ or Ar/1-5CO ₂	15-20



MIGINOX 316L

GMAW STAINLESS STEEL

AWS A/SFA 5.9 **ER316L**

CLASSIFICATION:

EN ISO 14343-A
G (19 12 3 L)

KEY FEATURES:

- An extra low carbon 19Cr/12Ni/Mo type stainless steel wire
- Offers improved corrosion and pitting resistance in marine and industrial environment
- High resistance against intergranular corrosion
- Resistant to SCC, hot cracking and chemical attack upto 850°C
- Radiographic quality welds

APPROVALS: IRS/CE

TYPICAL APPLICATIONS:

- Welding austenitic alloys represented by AISI 316, 316L, 317, 317L, 318 types
- Joining similar grade wrought and cast material
- Application in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries
- Cladding stainless steels

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni	Mo
0.03	1.7	0.4	18.3	11.5	2.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	550	36

Mechanical properties will vary with the type of shielding gas used.

PARAMETERS - PACKING DATA:

Ø, mm	Kg/Spool	 DCEP STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	 All Positions
0.8	12.5		
1.2	12.5		
1.6	12.5		

Shielding Gas	Gas Flow Rate, LPM
98Ar/2O ₂ or Ar/1-5CO ₂	15-20



TIGINOX 308L

GTAW STAINLESS STEEL

AWS A/SFA 5.9 **ER308L**

CLASSIFICATION:

EN ISO 14343-A
W 19 9 L

IS 5856
ES 20.10 L

KEY FEATURES:

- An extra low carbon 308L type stainless steel solid wire
- Excellent crack resistance
- Excellent corrosion & scaling resistance up to 800°C
- Resistance to intergranular corrosion
- Radiographic quality welds

APPROVALS: NPCIL/CE

TYPICAL APPLICATIONS:

- Welding Cr-Ni steels represented by AISI 301, 302, 304, 304L, 308, 308L
- SS piping in refineries, oil and gas industries, chemical plants, food processing industries
- Fabrication of boilers, reactors, turbines, pipes, tubes



TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:

C	Mn	Si	Cr	Ni
0.027	1.7	0.4	19.7	9.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	570	39

PARAMETERS - PACKING DATA:

Ø x L, mm 1.6 x 1000 2.0 x 1000 2.4 x 1000	Net Wt., Kg 20 20 20	 DCEN STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions 
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Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

Available in Standard carton packing of 20 kg box, containing 4 plastic tubes of 5 kg each.



TIGINOX 309L

GTAW STAINLESS STEEL

AWS A/SFA 5.9 **ER309L**

CLASSIFICATION:

EN ISO 14343-A
W 23 12 L

IS 5856
ES 24.13 L

KEY FEATURES:

- An extra low carbon 23Cr/12Ni type stainless steel wire
- Excellent corrosion and oxidation resistance up to 1100°C
- High ferrite content ensures highest cracking resistance
- Radiographic quality weld

APPROVALS: CE

TYPICAL APPLICATIONS:

- Welding of AISI 309, 309L type steels
- Dissimilar joints between stainless steels and low alloy or carbon steels
- Buffer layer on low alloy and carbon steels
- Joining corrosion resistant clad steels



TYPICAL CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt %:

C	Mn	Si	Cr	Ni
0.027	1.9	0.4	23.5	12.3

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	590	40

PARAMETERS - PACKING DATA:

Ø, mm	Net Wt, Kg	 DCEN STORAGE / HANDLING : Keep dry during storage and handling	 All Positions
1.6 x 1000	20		
2.0 x 1000	20		
2.4 x 1000	20		

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

Available in Standard carton packing of 20 kg box, containing 4 plastic tubes of 5 kg each.



TIGINOX 316L

GTAW STAINLESS STEEL

AWS A/SFA 5.9 **ER316L**

CLASSIFICATION:

EN ISO 14343-A
W (19 12 3 L)

IS 5856
ES 19.12.2 L

KEY FEATURES:

- An extra low carbon 19Cr/12Ni/Mo type stainless steel wire
- Offers improved corrosion and pitting resistance in marine and industrial environment
- High resistance against intergranular corrosion
- Resistant to SCC, hot cracking and chemical attack upto 850°C
- Radiographic quality welds

APPROVALS: IRS/CE

TYPICAL APPLICATIONS:

- Welding austenitic alloys represented by AISI 316, 316L, 317, 317L, 318 types
- Joining similar grade wrought and cast material
- Application in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries
- Cladding stainless steels



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Cr	Ni	Mo
0.03	1.7	0.4	18.3	11.5	2.2

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Typical	As Welded	550	36

PARAMETERS - PACKING DATA:

Ø, mm	Net Wt, Kg	 DCEN STORAGE / HANDLING : Keep dry during storage and handling	 All Positions
1.6 x 1000	20		
2.0 x 1000	20		
2.4 x 1000	20		

Shielding Gas	Gas Flow Rate, LPM
Ar	10-15

Available in Standard carton packing of 20 kg box, containing 4 plastic tubes of 5 kg each.



AUTOMIG FC 71T-1

FCAW C-Mn STEEL

AWS A/SFA 5.20 **E71T-1C**

CLASSIFICATION:

IS 15769

ET531RC-9

KEY FEATURES:

- Rutile type gas shielded FCW wire
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- High deposition rate
- Suitable for high quality single and multi pass welds
- All position capability
- Radiographic quality weld

APPROVALS: RDSO /ABS/BV/DNV/LRA/IRS/IBR/BIS/CE

TYPICAL APPLICATIONS:

- Welding of C-Mn steel with tensile strength up to 500 MPa
- Bridges, Shipbuilding, Towers, Cranes
- Chemical plant machinery, Hulls
- Storage tanks, Structural steel
- Construction equipment, Farm machinery, Rolling stocks
- General carbon steel fabrication

TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:


C	Mn	Si
0.06	1.4	0.4

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -20°C, J
Typical	As Welded	600	490	25	35

Hardness, 3 Layer: 200 BHN max

PARAMETERS - PACKING DATA:

Ø, mm	Net Wt, Kg	 DCEP	All Positions, Except Vertical Down
1.2	15		
1.6	15		
		STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	



Shielding Gas	Gas Flow Rate, LPM	Stickout, mm
CO ₂	15-20	10-20



AUTOMIG FC 81T1-Ni1

FCAW LOW ALLOY STEEL (Low Temperature)

AWS A/SFA 5.29 E81T1-Ni1C

KEY FEATURES:

- Rutile type gas shielded FCW wire
- Typical 1%Ni weld deposit
- Stable and smooth arc
- Low fumes, Minimal spatters
- Easy slag removal, smooth weld bead
- Excellent fracture toughness at -30°C
- Radiographic quality weld

APPROVALS: CE

TYPICAL APPLICATIONS:

- Welding of high tensile steel 1% Ni steel and equivalent materials
- Storage tanks for low temperature
- Offshore application, Bridges
- Refineries, power plants e.g. pressure vessels and heat exchangers, machinery



TYPICAL CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:

C	Mn	Si	Ni
0.06	1.2	0.5	1.0

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	YS at 0.2% offset, MPa	EL%	CVN Impact at -30°C, J
Typical	As Welded	600	520	22	35

PARAMETERS - PACKING DATA:

Ø , mm 1.2 1.6	Net Wt, Kg 15 15	 DCEP	All Positions, Except Vertical Down: 
STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box			

Shielding Gas	Gas Flow Rate, LPM
CO ₂	15-20



MIGINOX FC 308L

FCAW STAINLESS STEEL

AWS A/SFA 5.22 E308LT1-1/4

CLASSIFICATION:

EN ISO 17633-A

T 19 9 L P C1 2

T 19 9 LP M21 2

KEY FEATURES:

- Rutile based extra low carbon gas shielded stainless steel FCAW wire
- Typical 19Cr-10Ni weld deposit
- Stable arc, low spatter and easy slag removal
- Excellent bead appearance
- Excellent crack resistance and corrosion resistance
- Radiographic weld quality

APPROVALS: RDSO/CE

TYPICAL APPLICATIONS:

- Welding of 18Cr-8Ni stainless steels of AISI 301, 302, 304, 304L type
- Application in Chemical, Food processing industries, Pipes & tubes

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni	Mo
0.04 max	0.50-2.50	1.0 max	18.0-21.0	9.0-11.0	0.5 max

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA:

Ø , mm	Kg/Spool	 DCEP	All Positions, Except Vertical Down: 
1.2	12.5		
1.6	12.5		
		STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	

Shielding Gas	Gas Flow Rate, LPM
CO ₂	10-20
80Ar+20CO ₂	18-25



MIGINOX FC 309L

FCAW STAINLESS STEEL

AWS A/SFA 5.22 E309LT1-1/4

CLASSIFICATION:

EN ISO 17633-A

T 23 12 LP C1 2

T 23 12 LP M21 2

KEY FEATURES:

- An extra low carbon gas shielded stainless steel FCW wire
- Typical 23Cr-13Ni type weld deposit
- Stable arc, low spatter and easy slag removal
- Excellent bead appearance
- Excellent crack and corrosion resistance
- High oxidation resistance up to 1100°C
- Radiographic weld quality

APPROVALS: CE

TYPICAL APPLICATIONS:

- Welding of AISI 309L type steels and similar grade materials, castings, pipes and tubes
- Joining stainless steel to carbon steel
- For overlays, buttering on carbon and low alloy steels

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni	Mo
0.04 max	0.50-2.50	1.0 max	22.0-25.0	12.0-14.0	0.5 max

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Specification	As Welded	520 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA:

Ø, mm	Kg/Spool	 DCEP STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions, Except Vertical Down: 
1.2	12.5		
1.6	12.5		

Shielding Gas	Gas Flow Rate, LPM
CO ₂	10-20
80Ar+20CO ₂	18-25



MIGINOX FC 316L

FCAW STAINLESS STEEL

AWS A/SFA 5.22 **E316LT1-1/4**

CLASSIFICATION:

EN ISO 17633-B

TS 316L PC1 1

TS 316L PM21 1

KEY FEATURES:

- Rutile based extra low carbon gas shielded stainless steel FCAW wire
- Typical 18Cr/12Ni/2.5Mo weld deposit
- Controlled ferrite content ensures resistance against cracking
- Improved corrosion, pitting and intergranular corrosion resistance
- Stable arc and low spatter
- Excellent bead appearance
- Easy slag removal
- Radiographic weld quality

APPROVALS: CE

TYPICAL APPLICATIONS:

- Welding of AISI 316, 316L, 317, 317L, 318 type stainless steel and similar grade
- Welding pipes, tubes and vessels
- Cladding stainless steels
- Application in textile processing, Naval and Chemical environments, Paper and pulp, Paint and dye industries, Food processing industries

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL, Wt %:



C	Mn	Si	Cr	Ni	Mo
0.04 max	0.50-2.50	1.0 max	22.0-25.0	11.0-14.0	2.0-3.0

MECHANICAL PROPERTIES OF ALL WELD METAL:

	Condition	UTS, MPa	EL%
Specification	As Welded	485 min	30 min

With mixed gas chemical composition and mechanical properties will be higher.

PARAMETERS - PACKING DATA:

Ø , mm	Kg/Spool	 DCEP STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions, Except Vertical Down: 
1.2	12.5		
1.6	12.5		

Shielding Gas	Gas Flow Rate, LPM
CO ₂	10-20
80Ar+20CO ₂	18-25



AUTOMIG FC 580

FCAW HARD FACING Abrasion-Impact

ALLOY BASIS :

C, Cr, Si

KEY FEATURES:

- Basic type flux cored wire
- Smooth arc characteristics
- Low spatter, low fumes
- Non-machinable air hardenable deposit
- Resist high stress abrasion and friction
- Can withstand impact load of medium severity
- Resistant to spalling and cracking



TYPICAL APPLICATIONS:

- Hard facing applications on carbon steel and manganese components
- Machine parts subjected to high frictional wear
- Repair on damaged cold cutting tools
- Surfacing on austenitic manganese steels
- Screw conveyers, concrete mixer blades, crusher jaws and cones
- Pug mill screws, coal chutes dipper teeth, bucket teeth, crusher plates
- Brick machinery, pellet plant and tamping tools

MECHANICAL PROPERTIES OF ALL WELD METAL:




Condition	Hardness, 3 Layer HRC (BHN) , Typical
As Welded	55 (570)

PARAMETERS - PACKING DATA:

Ø , mm 1.2 1.6	Kg/Spool 15 15	 DCEP STORAGE / HANDLING : Keep dry and follow handling instructions mentioned on the box	All Positions, Except Vertical Down: 
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Shielding Gas	Gas Flow Rate, LPM
CO ₂	10-15

Physical Properties: With increase in number of squares, property improves

Machinability	Metal to Metal WearResistance	Impact Resistance	Corrosion Resistance
			



C-Mn STEEL WIRES FOR SAW WELDING

COPPER COATED C-Mn STEEL SOLID WIRES

CLASSIFICATION :

Product	EN 14171	AWS A/SFA 5.17
AUTOMELT EL8	S1	EL8
AUTOMELT EM12K	S2Si	EM12K
AUTOMELT EH10K	S3	EH10K
AUTOMELT EH12K	S3Si	EH12K
AUTOMELT EH11K	-	EH11K
AUTOMELT EH14	S4	EH14

KEY FEATURES :

- Uniform copper coating
- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% (Typical, Including Cu in coating)

Product	C	Mn	Si	Cu
AUTOMELT EL8	0.06	0.50	0.03	0.1
AUTOMELT EM12K	0.09	1.00	0.20	0.1
AUTOMELT EH10K	0.08	1.40	0.15	0.1
AUTOMELT EH12K	0.10	1.55	0.25	0.1
AUTOMELT EH11K	0.09	1.50	0.90	0.1
AUTOMELT EH14	0.12	1.70	0.04	0.1

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	SAWPAC DRUM, Kg
AUTOMELT EL8	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EM12K	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EH10K	2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EH12K	2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EH11K	1.6, 2.0, 2.5, 3.15, 4.0, 5.0	25	1.6 - 100 / 250 Others – 350 / 500
AUTOMELT EH14	2.5, 3.15, 4.0, 5.0	25	350 / 500

WIRES FOR SUBMERGED ARC WELDING OF CREEP RESISTANT STEELS



COPPER COATED C-Mn STEEL SOLID WIRES

CLASSIFICATION :			
Product	EN 14171	EN 12070	AWS A/SFA 5.23
AUTOMELT EA2	S2Mo	-	EA2
AUTOMELT EA3	S4Mo	-	EA3
AUTOMELT EA4	S3Mo	S MnMo	EA4
AUTOMELT EB2	-	S CrMo1	EB2
AUTOMELT EB2R	-	S CrMo1	EB2R
AUTOMELT EB3	-	S CrMo2	EB3
AUTOMELT EB3R	-	S CrMo2	EB3R
AUTOMELT EB6	-	S CrMo5	EB6
AUTOMELT EB91	-	S CrMo91	EB91

KEY FEATURES :

- Uniform copper coating
- Smooth feeding
- Close dimensional tolerances
- Controlled Chemistry

CHEMICAL COMPOSITION OF BARE SOLID WIRE, Wt% (Typical, Including Cu in coating)

Product	C	Mn	Si	Cr	Mo	Cu	Other
AUTOMELT EA2	0.09	1.10	0.15	-	0.50	0.10	-
AUTOMELT EA3	0.09	1.80	0.15	-	0.50	0.10	-
AUTOMELT EA4	0.09	1.40	0.15	-	0.50	0.10	-
AUTOMELT EB2	0.10	0.60	0.15	1.25	0.50	0.10	-
AUTOMELT EB2R	0.10	0.60	0.15	1.25	0.50	0.10	S-0.007; P-0.008; As-0.004; Sn-0.004; Sb-0.004; Bruscatto factor X <15
AUTOMELT EB3	0.10	0.60	0.15	2.40	1.00	0.10	-
AUTOMELT EB3R	0.10	0.60	0.15	2.40	1.00	0.10	S-0.007; P-0.008; As-0.004; Sn-0.004; Sb-0.004; Bruscatto factor X <15
AUTOMELT EB6	0.08	0.60	0.30	6.00	0.6	0.10	-
AUTOMELT EB91	0.10	0.40	0.25	9.00	1.00	0.07	Ni-0.5; V-0.2; Nb-0.05; N-0.05; Al-0.005

DIAMETERS - PACKING DATA :

Product	Ø, mm	Kg / Spool	SAWPAC DRUM, Kg
AUTOMELT EA2	2.0, 2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EA3	2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EA4	2.0, 2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EB2	2.0, 2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EB2R	2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EB3	2.0, 2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EB3R	2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EB6	2.5, 3.15, 4.0, 5.0	25	350 / 500
AUTOMELT EB91	2.5, 3.15, 4.0, 5.0	25	350 / 500



AUTOMELT A55 (AUTOMELT Gr II)

SAW Flux

GENERAL DESCRIPTION:

- Agglomerated Flux
- Aluminate- Rutile Type Flux
- Acidic Flux having Basicity Index of 0.6
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding (With EM12K Wire restrict to 15 mm thickness for multi-pass)
- For Carbon Steels
- Suitable for Single Wire & Tandem System
- Suitable for Welding Speeds of 0.35-0.60 m/min
- Grain Size – 0.25-2.00 mm
- Type of Current – DCEP / AC 800A
- Wall Neutrality Number with EL8 Wire is 56

APPROVALS: RDSO/ABS/BV/DNV/IRS/LRA/IBR

CLASSIFICATION :

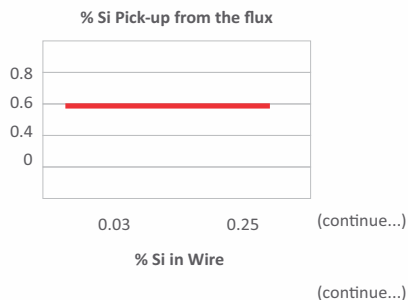
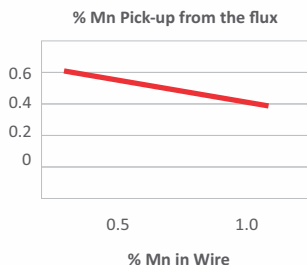
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8 (AUTOMELT Gr.A)	F7AZ/PZ-EL8	Multi-pass
AUTOMELT EM12K	F7A0/P0-EM12K	Limited Multi-pass
AUTOMELT EH11K	F7AZ-EH11K	Single Pass

TYPICAL APPLICATIONS :

- General Structural Welding
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Cylinders and vessels



ACTIVITY OF THE FLUX:





AUTOMELT A55 (AUTOMELT Gr II)

SAW Flux

CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
30	10	45	15

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8 (Automelt GrA)	0.06	1.10	0.65
Automelt EM12K	0.07	1.40	0.80
Automelt EH11K	0.07	1.80	1.10

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact	
					0°C	-20°C
Automelt EL8 (Automelt Gr.A)	AW	530	440	25	50	-
Automelt EL8	PW	500	420	27	60	-
Automelt EL12	PW	510	430	28	60	-
Automelt EM12K	AW	540	450	28	-	40
Automelt EM12K	PW	510	430	30	-	50

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

Available in Standard packing of 30 Kg.



AUTOMELT A57

SAW Flux

GENERAL DESCRIPTION:

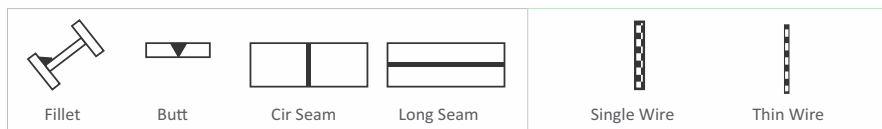
- Agglomerated Flux
- Aluminate-Rutile Type Flux
- Acidic Flux having Basicity Index of 0.5
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding (With EM12K Wire restrict to 15 mm thickness for multi-pass)
- For Carbon Steels
- Suitable for Single Wire System & thin wire SAW
- Suitable for Welding Speeds of 0.20-0.75 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP 800A
- Wall Neutrality Number with EL8 Wire is 60

CLASSIFICATION :

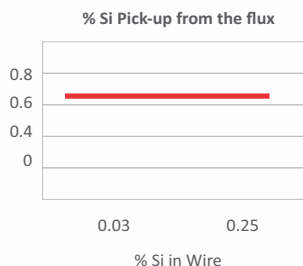
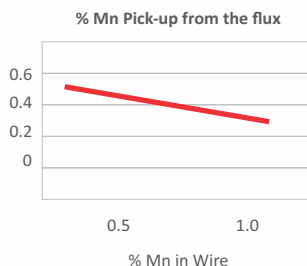
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7AZ/PZ-EL8	Multi-pass
AUTOMELT EM12K	F7AZ-EM12K	Limited Multi-pass

TYPICAL APPLICATIONS :

- General Structural Welding
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Cylinders and vessels



ACTIVITY OF THE FLUX:



(continue...)



AUTOMELT A57

SAW Flux

CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
25	10	55	5

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8	0.07	1.00	0.70
Automelt EM12K	0.07	1.30	0.80

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J) 0°C
Automelt EL8	AW	530	440	25	40
Automelt EL8	PW	500	420	27	50
Automelt EM12K	AW	540	450	28	40

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

Available in Standard packing of 30 Kg.



AUTOMELT A82

SAW Flux

GENERAL DESCRIPTION:

- Agglomerated Flux
- Aluminate- Rutile Type Flux
- Acidic Flux having Basicity Index of 0.6
- Active Flux with moderate Si and Mn pick-up
- For Single and Multi-pass Butt and fillet welding at very high speeds
- For C-Mn Steels
- Suitable for Single and twin Wire system
- Suitable for Welding Speeds of 0.40-1.80 m/min
- Grain Size – 0.25-1.40 mm
- Type of Current – DC / AC 1000A
- Wall Neutrality Number with EM12K Wire is 85

CLASSIFICATION :

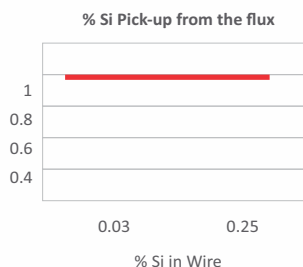
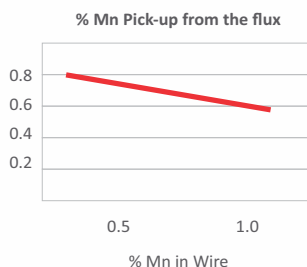
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7AZ-EL8	Limited Multi-pass
AUTOMELT EM12K	F7AZ-EM12K	Limited Multi-pass

TYPICAL APPLICATIONS :

- Structural Welding
- High Speed Fillet Welding
- Fabrication of H & I Beams
- Fabrication of Boilers, Cylinders



ACTIVITY OF THE FLUX:



(continue...)



AUTOMELT A82

SAW Flux

CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
25	10	50	10

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8	0.06	1.20	1.00
Automelt EM12K	0.06	1.60	1.30

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E
Automelt EL8	AW	550	460	22
Automelt EM12K	AW	560	470	23

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

Available in Standard packing of 30 Kg.



AUTOMELT B31 (AUTOMELT Gr IV)

SAW Flux

GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- Basic Flux having Basicity Index of 1.6
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding
- For Carbon Manganese Steels
- Suitable for Single Wire System
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-2.00 mm
- Type of Current – DCEP
- Wall Neutrality Number with EH14 Wire is 7

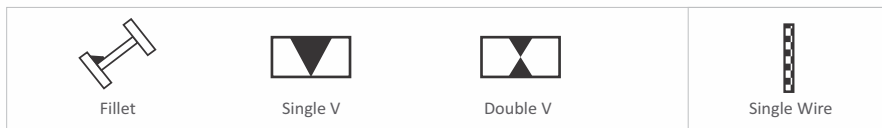
APPROVALS: RDSO/ABS/BV/DNV/IRS/LRA/IBR

CLASSIFICATION :

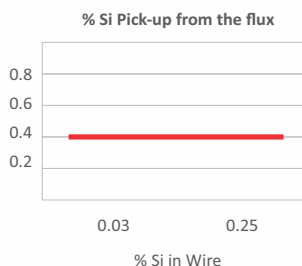
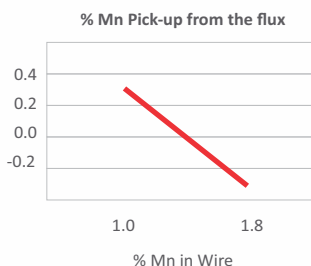
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8 (AUTOMELT Gr.A)	F6A2-EL8	Multi-pass
AUTOMELT EH14	F7A4/P4-EH14	Multi-pass

TYPICAL APPLICATIONS :

- General Structural Welding
- Boiler and Pressure Vessel Fabrication



ACTIVITY OF THE FLUX:



(continue...)



AUTOMELT B31 (AUTOMELT Gr IV)

SAW Flux

CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
15	20	30	35

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si
Automelt EL8 (Automelt Gr.A)	0.06	0.85	0.40
Automelt EH14	0.07	1.50	0.40

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact		
					-20°C	-30°C	-40°C
AUTOMELT EL8 (Automelt Gr.A)	AW	470	390	28	50	-	-
Automelt EH14	AW	540	460	30	-	-	40
Automelt EH14	PW	510	430	33	-	-	50

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

Available in Standard packing of 30 Kg.



AUTOMELT B71

SAW Flux

GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- Basic Flux having Basicity Index of 1.6
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding including "two-run" technique
- For Carbon & Low Alloy Steels
- Suitable for Narrow Gap Welding
- Suitable for Single & Multi Wire twin and Tandem System
- Suitable for Welding Speeds of 0.35-0.70 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC
- Wall Neutrality Number with EM12K Wire is 12










APPROVALS: RDSO/ABS/IBR

CLASSIFICATION :

With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EL8	F7A2-EL8	Multi-pass
AUTOMELT EL12	F7A2-EL12	Multi-pass
AUTOMELT EM12K	F7A4/P4-EM12K	Multi-pass
AUTOMELT EH10K	F7A4/P4-EH10K	Multi-pass
AUTOMELT EH12K	F7A4/P4-EH12K	Multi-pass
AUTOMELT EH14	F7A4/P4-EH14	Multi-pass
AUTOMELT EA2	F8A2/P2-EA2-A2	Multi-pass
AUTOMELT EA4	F8A2/P2-EA4-A4	Multi-pass
AUTOMELT EA3	F8A2/P2-EA3-A3	Multi-pass
AUTOMELT EB2	F8P2-EB2-B2	Multi-pass
AUTOMELT EB3	F8P2-EB3-B3	Multi-pass
AUTOMELT ENi1	F8A5-ENi1-Ni1	Multi-pass
AUTOMELT ENi2	F8A6-ENi2-Ni2	Multi-pass
AUTOMELT ENi3	F8A8/P10-ENi3-Ni3	Multi-pass

TYPICAL APPLICATIONS :

- General Structural Welding
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Pressure Vessel and Boiler
- Heavy Equipment Fabrication

									
Fillet	Single V	Narrow Gap	Double V	Single U	Cir Seam	Long Seam	Single Wire	Tandem	Twin

(continue...)

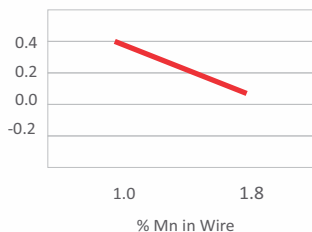


AUTOMELT B71

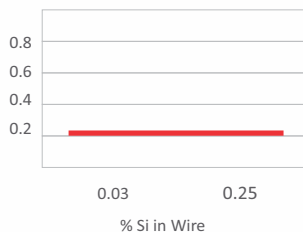
SAW Flux

ACTIVITY OF THE FLUX:

% Mn Pick-up from the flux



% Si Pick-up from the flux



CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
15	30	30	25

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Ni	Cr	Mo	Other Elements
AUTOMELT EL8	0.06	0.80	0.30	-	-	-	-
AUTOMELT EL12	0.08	0.80	0.30	-	-	-	-
AUTOMELT EM12K	0.08	1.45	0.45	-	-	-	-
AUTOMELT EH10K	0.07	1.60	0.45	-	-	-	-
AUTOMELT EH12K	0.08	1.75	0.50	-	-	-	-
AUTOMELT EH14	0.08	1.90	0.40	-	-	-	-
AUTOMELT EA2	0.08	1.35	0.30	-	-	0.50	-
AUTOMELT EA4	0.08	1.50	0.30	-	-	0.50	-
AUTOMELT EA3	0.08	1.80	0.30	-	-	0.50	-
AUTOMELT EB2	0.07	1.10	0.40	-	1.10	0.50	-
AUTOMELT EB3	0.07	1.10	0.40	-	2.10	1.00	-
AUTOMELT ENi1	0.08	1.40	0.45	0.90	-	-	-
AUTOMELT ENi2	0.09	1.40	0.45	2.20	-	-	-
AUTOMELT ENi3	0.09	1.40	0.45	3.00	-	-	-

(continue...)



AUTOMELT B71

SAW Flux

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:									
With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact (J)				
					-30°C	-40°C	-50°C	-60°C	-70°C
Automelt EL8	AW	500	420	26	50	-	-	-	-
Automelt EL12	AW	520	430	26	50	-	-	-	-
Automelt EM12K	AW	530	430	26	-	50	-	-	-
Automelt EM12K	PW1	500	420	28	-	60	-	-	-
Automelt EH10K	AW	590	500	26	-	60	-	-	-
Automelt EH10K	PW1	530	460	28	-	70	-	-	-
Automelt EH12K	AW	560	450	25	-	70	-	-	-
Automelt EH12K	PW1	540	430	27	-	60	-	-	-
Automelt EH14	AW	550	440	26	-	70	-	-	-
Automelt EH14	PW1	530	430	28	-	-	-	-	-
Automelt EA2	AW	600	520	24	40	-	-	-	-
Automelt EA2	PW1	580	510	25	40	-	-	-	-
Automelt EA4	AW	660	570	24	50	-	-	-	-
Automelt EA4	PW1	650	560	26	60	-	-	-	-
Automelt EA3	AW	690	590	24	40	-	-	-	-
Automelt EA3	PW1	680	580	25	40	-	-	-	-
Automelt EB2	PW2	600	490	24	-	-	-	-	-
Automelt EB3	PW2	630	510	24	-	-	-	-	-
Automelt ENi1	AW	580	470	25	-	-	40	-	-
Automelt ENi2	AW	600	490	25	-	-	50	-	-
Automelt ENi3	AW	620	510	26	-	-	-	50	-
Automelt ENi3	PW1	600	490	27	-	-	-	-	50

AW – As Welded; PW1 – After Post weld heat treatment of 620°C for 1 hour

PW2 – After Post Weld Heat treatment of 690°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

Available in Standard packing of 30 Kg Bag



AUTOMELT B41

SAW Flux

GENERAL DESCRIPTION:

- Agglomerated Flux
- Fluoride-Basic Type Flux
- High Basic Flux having Basicity Index of 3.1
- Neutral behaviour to activity
- Multi-pass Butt and Fillet Welding including two run technique
- For Carbon & Low Alloy Steels
- Suitable for Single & Multi Wire Tandem System
- Suitable for Welding Speeds of 0.40 – 0.60 m/min
- Grain Size – 0.25-1.60 mm
- Type of Current – DCEP / AC
- Wall Neutrality Number with EH10K is 5

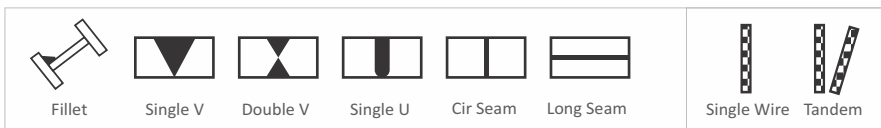
APPROVALS: IBR

CLASSIFICATION :

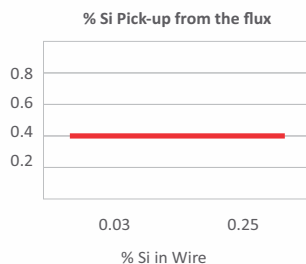
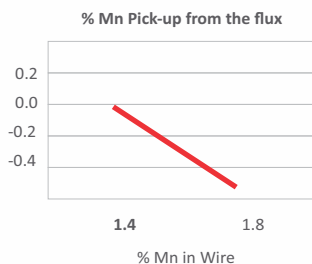
With Wire	AWS 5.17/5.23	Single / Multi-pass
AUTOMELT EH10K	F7A8/P8-EH10K	Multi-pass
AUTOMELT EH12K	F7A8/P8-EH12K	Multi-pass
AUTOMELT EH14	F7A6/P6-EH14	Multi-pass
AUTOMELT EA2	F8A4-EA2-A2	Multi-pass
AUTOMELT EA4	F8A4/P4-EA4-A4	Multi-pass
AUTOMELT EA3	F8A4/P4-EA3-A3	Multi-pass

TYPICAL APPLICATIONS :

- Fabrication of Reactors, steam generators
- Long Seam and Cir Seam Welding of Pipes
- Fabrication of Pressure Vessel and Boiler
- Heavy Equipment Fabrication



ACTIVITY OF THE FLUX:



(continue...)



AUTOMELT B41

SAW Flux

CHEMICAL COMPOSITION OF FLUX:

$\text{SiO}_2 + \text{TiO}_2$	$\text{CaO} + \text{MgO}$	$\text{Al}_2\text{O}_3 + \text{MnO}$	CaF_2
10	35	20	30

CHEMICAL COMPOSITION OF UNDILUTED WELD METAL (Wt%), TYPICAL:

With wire	C	Mn	Si	Ni	Cr	Mo
AUTOMELT EH10K	0.07	1.50	0.45	-	-	-
AUTOMELT EH12K	0.08	1.60	0.45	-	-	-
AUTOMELT EH14	0.08	1.80	0.40	-	-	-
AUTOMELT EA2	0.08	1.35	0.30	-	-	0.50
AUTOMELT EA4	0.08	1.50	0.30	-	-	0.50
AUTOMELT EA3	0.08	1.80	0.30	-	-	0.50

MECHANICAL PROPERTIES OF ALL WELD METAL, TYPICAL:

With wire	Condition	UTS, MPa	YS, MPa	% E	CVN Impact		
					-40°C	-50°C	-60°C
Automelt EH10K	AW	550	440	26	-	60	-
Automelt EH10K	PW	530	430	28	-	80	-
Automelt EH12K	AW	560	450	26	-	80	50
Automelt EH12K	PW	540	430	27	-	90	60
Automelt EH14	AW	550	440	26	60	50	-
Automelt EH14	PW	530	430	28	80	60	-
Automelt EA2	AW	580	470	24	40	-	-
Automelt EA2	PW	560	460	25	50	-	-
Automelt EA4	AW	600	490	24	40	-	-
Automelt EA4	PW	580	470	26	50	-	-
Automelt EA3	AW	630	500	24	40	-	-
Automelt EA3	PW	610	480	25	50	-	-

AW – As Welded; PW – After Post weld heat treatment of 620°C for 1 hour

The chemistry and mechanical properties will depend on actual wire chemistry and arc voltage

Available in Standard packing of 30 Kg.



Item Code Welding Consumables

Section III



ITEM CODE

WELDING ELECTRODES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Superbond	E6013	2.5	350	20	WCE.GN.001.2503
Superbond	E6013	3.15	350	20	WCE.GN.001.3153
Superbond	E6013	3.15	450	20	WCE.GN.001.3154
Superbond	E6013	4	450	20	WCE.GN.001.4004
Superbond	E6013	5	450	20	WCE.GN.001.5004
Superbond S	E6013	1.6	250	16	WCE.GN.002.1601
Superbond S	E6013	2	300	20	WCE.GN.002.2002
Superbond S	E6013	2.5	350	20	WCE.GN.002.2503
Superbond S	E6013	3.15	350	20	WCE.GN.002.3153
Superbond S	E6013	3.15	450	20	WCE.GN.002.3154
Superbond S	E6013	4	450	20	WCE.GN.002.4004
Superbond S	E6013	5	450	20	WCE.GN.002.5004
Superbond SS	E6013	2.5	350	20	WCE.GN.004.2503
Superbond SS	E6013	3.15	450	20	WCE.GN.004.3154
Superbond SS	E6013	4	450	20	WCE.GN.004.4004
Superbond SS	E6013	5	450	20	WCE.GN.004.5004
Kingbond S	E6013	2.5	350	16.5	WCE.GN.016.2503
Kingbond S	E6013	3.15	350	15.5	WCE.GN.016.3153
Kingbond S	E6013	3.15	450	20	WCE.GN.016.3154
Kingbond S	E6013	4	450	20.25	WCE.GN.016.4004
Kingbond S	E6013	5	450	20.25	WCE.GN.016.5004
Metalbond	E6013	2.5	350	20	WCE.GN.006.2503
Metalbond	E6013	3.15	350	20	WCE.GN.006.3153
Metalbond	E6013	3.15	450	20	WCE.GN.006.3154
Metalbond	E6013	4	450	20	WCE.GN.006.4004
Metalbond	E6013	5	450	20	WCE.GN.006.5004
X Bond	E7018	2.5	350	20	WCE.MN.025.2503
X Bond	E7018	3.15	450	20	WCE.MN.025.3154
X Bond	E7018	4	450	20	WCE.MN.025.4004
X Bond	E7018	5	450	20	WCE.MN.025.5004
Supabase	E7018	2.5	350	20	WCE.MN.001.2503
Supabase	E7018	3.15	450	20	WCE.MN.001.3154
Supabase	E7018	4	450	20	WCE.MN.001.4004
Supabase	E7018	5	450	20	WCE.MN.001.5004



ITEM CODE

WELDING ELECTRODES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Supabase X Plus	E7018	2.5	350	20	WCE.MN.003.2503
Supabase X Plus	E7018	3.15	450	20	WCE.MN.003.3154
Supabase X Plus	E7018	4	450	20	WCE.MN.003.4004
Supabase X Plus	E7018	5	450	20	WCE.MN.003.5004
Supabase X Plus	E7018	6.3	450	20	WCE.MN.003.6304
Tenalloy Z Plus	E7018-1	2.5	350	20	WCE.MN.016.2503
Tenalloy Z Plus	E7018-1	3.15	450	20	WCE.MN.016.3154
Tenalloy Z Plus	E7018-1	4	450	20	WCE.MN.016.4004
Tenalloy Z Plus	E7018-1	5	450	20	WCE.MN.016.5004
Tenalloy 16	E7016	2.5	350	20	WCE.LN.001.2503
Tenalloy 16	E7016	3.15	450	20	WCE.LN.001.3154
Tenalloy 16	E7016	4	450	20	WCE.LN.001.4004
Tenalloy 16	E7016	5	450	20	WCE.LN.001.5004
Celwel 60	E6010	2.5	350	18	WCE.CN.001.2503
Celwel 60	E6010	3.15	350	18	WCE.CN.001.3153
Celwel 60	E6010	4	350	18	WCE.CN.001.4003
Celwel 60	E6010	5	350	18	WCE.CN.001.5003
Molyten	E7018-A1	2.5	350	20	WCE.LN.024.2503
Molyten	E7018-A1	3.15	450	20	WCE.LN.024.3154
Molyten	E7018-A1	4	450	20	WCE.LN.024.4004
Molyten	E7018-A1	5	450	20	WCE.LN.024.5004
Cromoten	E 8018-B2	2.5	350	20	WCE.LN.027.2503
Cromoten	E 8018-B2	3.15	350	20	WCE.LN.027.3153
Cromoten	E 8018-B2	3.15	450	20	WCE.LN.027.3154
Cromoten	E 8018-B2	4	350	20	WCE.LN.027.4003
Cromoten	E 8018-B2	4	450	20	WCE.LN.027.4004
Cromoten	E 8018-B2	5	450	20	WCE.LN.027.5004
Cromoten C	E9018-B3	2.5	350	20	WCE.LN.034.2503
Cromoten C	E9018-B3	3.15	350	20	WCE.LN.034.3153
Cromoten C	E9018-B3	3.15	450	20	WCE.LN.034.3154
Cromoten C	E9018-B3	4	350	20	WCE.LN.034.4003
Cromoten C	E9018-B3	4	450	20	WCE.LN.034.4004
Cromoten C	E9018-B3	5	450	20	WCE.LN.034.5004
Tenalloy 55	E8018-G	2.5	350	20	WCE.LN.005.2503
Tenalloy 55	E8018-G	3.15	450	20	WCE.LN.005.3154
Tenalloy 55	E8018-G	4	450	20	WCE.LN.005.4004
Tenalloy 55	E8018-G	5	450	20	WCE.LN.005.5004



ITEM CODE

WELDING ELECTRODES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Superinox 1A	E308-16	2	300	10	WCE.SN.029.2002
Superinox 1A	E308-16	2.5	350	10	WCE.SN.029.2503
Superinox 1A	E308-16	3.15	350	10	WCE.SN.029.3153
Superinox 1A	E308-16	4	350	10	WCE.SN.029.4003
Superinox 1A	E308-16	5	350	10	WCE.SN.029.5003
Striker 308L	E308L-16	2.5	350	10	WCE.SN.110.2503
Striker 308L	E308L-16	3.15	350	10	WCE.SN.110.3153
Striker 308L	E308L-16	4	350	10	WCE.SN.110.4003
King Steel	-	2.5	350	10	WCE.SN.109.2503
King Steel	-	3.15	350	10	WCE.SN.109.3153
King Steel	-	4	350	10	WCE.SN.109.4003
Superinox 1C	E308L-16	1.6	250	5	WCE.SN.031.1601
Superinox 1C	E308L-16	2	300	10	WCE.SN.031.2002
Superinox 1C	E308L-16	2.5	350	10	WCE.SN.031.2503
Superinox 1C	E308L-16	3.15	350	10	WCE.SN.031.3153
Superinox 1C	E308L-16	4	350	10	WCE.SN.031.4003
Superinox 1C	E308L-16	5	350	10	WCE.SN.031.5003
Superinox 2A	E316-16	2	300	10	WCE.SN.032.2002
Superinox 2A	E316-16	2.5	350	10	WCE.SN.032.2503
Superinox 2A	E316-16	3.15	350	10	WCE.SN.032.3153
Superinox 2A	E316-16	4	350	10	WCE.SN.032.4003
Superinox 2A	E316-16	5	350	10	WCE.SN.032.5003
Superinox 2C	E316L-16	1.6	250	5	WCE.SN.034.1601
Superinox 2C	E316L-16	2	300	10	WCE.SN.034.2002
Superinox 2C	E316L-16	2.5	350	10	WCE.SN.034.2503
Superinox 2C	E316L-16	3.15	350	10	WCE.SN.034.3153
Superinox 2C	E316L-16	4	350	10	WCE.SN.034.4003
Superinox 2C	E316L-16	5	350	10	WCE.SN.034.5003
Superinox 1B	E347-16	2.5	350	10	WCE.SN.030.2503
Superinox 1B	E347-16	3.15	350	10	WCE.SN.030.3153
Superinox 1B	E347-16	4	350	10	WCE.SN.030.4003
Superinox 1B	E347-16	5	350	10	WCE.SN.030.5003
Betanox D	E309-16	2.5	350	10	WCE.SN.008.2503
Betanox D	E309-16	3.15	350	10	WCE.SN.008.3153
Betanox D	E309-16	4	350	10	WCE.SN.008.4003
Betanox D	E309-16	5	350	10	WCE.SN.008.5003



ITEM CODE

WELDING ELECTRODES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Betanox DL	E309L-16	2.5	350	10	WCE.SN.009.2503
Betanox DL	E309L-16	3.15	350	10	WCE.SN.009.3153
Betanox DL	E309L-16	4	350	10	WCE.SN.009.4003
Betanox DL	E309L-16	5	350	10	WCE.SN.009.5003
Superinox 312	E312-16	1.6	250	10	WCE.SN.044.1601
Superinox 312	E312-16	2	300	10	WCE.SN.044.2002
Superinox 312	E312-16	2.5	350	10	WCE.SN.044.2503
Superinox 312	E312-16	3.15	350	10	WCE.SN.044.3153
Superinox 312	E312-16	4	350	10	WCE.SN.044.4003
Superinox 312	E312-16	5	350	10	WCE.SN.044.5003
Betanox C	E310-16	2.5	350	10	WCE.SN.006.2503
Betanox C	E310-16	3.15	350	10	WCE.SN.006.3153
Betanox C	E310-16	4	350	10	WCE.SN.006.4003
Betanox C	E310-16	5	350	10	WCE.SN.006.5003
Zedalloy 350	-	3.15	450	20	WCE.HN.002.3154
Zedalloy 350	-	4	450	20	WCE.HN.002.4004
Zedalloy 350	-	5	450	20	WCE.HN.002.5004
Zedalloy 550	-	3.15	450	20	WCE.HN.004.3154
Zedalloy 550	-	4	450	20	WCE.HN.004.4004
Zedalloy 550	-	5	450	20	WCE.HN.004.5004
Zedalloy 550 LH	-	3.15	450	20	WCE.HN.006.3154
Zedalloy 550 LH	-	4	450	20	WCE.HN.006.4004
Zedalloy 550 LH	-	5	450	20	WCE.HN.006.5004
Zedalloy 600	-	3.15	450	20	WCE.HN.009.3154
Zedalloy 600	-	4	450	20	WCE.HN.009.4004
Zedalloy 600	-	5	450	20	WCE.HN.009.5004
Zedalloy 12Mn	-	3.15	450	20	WCE.HN.010.3154
Zedalloy 12Mn	-	4	450	20	WCE.HN.010.4004
Zedalloy 12Mn	-	5	450	20	WCE.HN.010.5004
Zedalloy 12Mn	-	6.3	450	20	WCE.HN.010.6304
Zedalloy VB	-	3.15	450	20	WCE.HN.007.3154
Zedalloy VB	-	4	450	20	WCE.HN.007.4004
Zedalloy VB	-	5	450	20	WCE.HN.007.5004



ITEM CODE

CONTINUOUS WELDING CONSUMABLES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Automig I	ER70S-6	0.8	-	15 Kg Spool	WCW.ML.018.0802
Automig I	ER70S-6	0.9	-	15 Kg Spool	WCW.ML.018.0902
Automig I	ER70S-6	1	-	15 Kg Spool	WCW.ML.018.1002
Automig I	ER70S-6	1.2	-	15 Kg Spool	WCW.ML.018.1202
Automig I	ER70S-6	1.4	-	15 Kg Spool	WCW.ML.018.1402
Automig I	ER70S-6	1.6	-	15 Kg Spool	WCW.ML.018.1602
Tigfil 70S-2	ER70S-2	1.6	1000	20	WCW.TC.002.1606
Tigfil 70S-2	ER70S-2	2	1000	20	WCW.TC.002.2006
Tigfil 70S-2	ER70S-2	2.4	1000	20	WCW.TC.002.2406
Tigfil 70S-2	ER70S-2	3.15	1000	20	WCW.TC.002.3156
Tigfil 70S-2	ER70S-2	4	1000	20	WCW.TC.002.4006
Tigfil 70S-2 (15Kg Spool)	ER70S-2	1.2	-	15 Kg Spool	WCW.ML.005.1202
Tigfil 70S-2 (15Kg Spool)	ER70S-2	1.6	-	15 Kg Spool	WCW.ML.005.1602
Tigfil 80S-B2	ER80S-B2	1.6	1000	20	WCW.TC.007.1606
Tigfil 80S-B2	ER80S-B2	2	1000	20	WCW.TC.007.2006
Tigfil 80S-B2	ER80S-B2	2.4	1000	20	WCW.TC.007.2406
Tigfil 80S-B2	ER80S-B2	3.15	1000	20	WCW.TC.007.3156
Tigfil 90S-B3	ER90S-B3	1.6	1000	20	WCW.TC.008.1606
Tigfil 90S-B3	ER90S-B3	2	1000	20	WCW.TC.008.2006
Tigfil 90S-B3	ER90S-B3	2.4	1000	20	WCW.TC.008.2406
Tigfil 90S-B3	ER90S-B3	3.15	1000	20	WCW.TC.008.3156
Automig 80S-D2	ER80S-D2	1.2	-	15 Kg Spool	WCW.ML.011.1202
Automig 80S-D2	ER80S-D2	1.6	-	15 Kg Spool	WCW.ML.011.1602
Automig-80S-G	ER80S-G	1.2	-	15 Kg Spool	WCW.ML.003.1202
Automig-80S-G	ER80S-G	1.6	-	15 Kg Spool	WCW.ML.003.1602
Automig 90S-D2	ER90S-D2	1.2	-	15 Kg Spool	WCW.ML.002.1202
Automig 90S-D2	ER90S-D2	1.6	-	15 Kg Spool	WCW.ML.002.1602
Automig IV	-	1.2	-	11.5Kg Spool	WCW.ML.019.1211
Automig IV	-	1.6	-	11.5Kg Spool	WCW.ML.019.1611
Miginox 308L	ER308L	0.8	-	12.5 Kg Spool	WCW.MX.002.0804
Miginox 308L	ER308L	1	-	12.5 Kg Spool	WCW.MX.002.1004
Miginox 308L	ER308L	1.2	-	12.5 Kg Spool	WCW.MX.002.1204
Miginox 308L	ER308L	1.6	-	12.5 Kg Spool	WCW.MX.002.1604



ITEM CODE

CONTINUOS WELDING CONSUMABLES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Miginox 309L	ER309L	0.8	-	12.5 Kg Spool	WCW.MX.004.0804
Miginox 309L	ER309L	1	-	12.5 Kg Spool	WCW.MX.004.1004
Miginox 309L	ER309L	1.2	-	12.5 Kg Spool	WCW.MX.004.1204
Miginox 309L	ER309L	1.6	-	12.5 Kg Spool	WCW.MX.004.1604
Miginox 316L	ER316L	0.8	-	12.5 Kg Spool	WCW.MX.009.0804
Miginox 316L	ER316L	1	-	12.5 Kg Spool	WCW.MX.009.1004
Miginox 316L	ER316L	1.2	-	12.5 Kg Spool	WCW.MX.009.1204
Miginox 316L	ER316L	1.6	-	12.5 Kg Spool	WCW.MX.009.1604
Tiginox 308L	ER308L	1.6	1000	20	WCW.TU.002.1606
Tiginox 308L	ER308L	2	1000	20	WCW.TU.002.2006
Tiginox 308L	ER308L	2.4	1000	20	WCW.TU.002.2406
Tiginox 308L	ER308L	3.15	1000	20	WCW.TU.002.3156
Tiginox 308L	ER308L	4	1000	20	WCW.TU.002.4006
Tiginox 309L	ER309L	1.6	1000	20	WCW.TU.004.1606
Tiginox 309L	ER309L	2	1000	20	WCW.TU.004.2006
Tiginox 309L	ER309L	2.4	1000	20	WCW.TU.004.2406
Tiginox 309L	ER309L	3.15	1000	20	WCW.TU.004.3156
Tiginox 316L	ER316L	1.6	1000	20	WCW.TU.009.1606
Tiginox 316L	ER316L	2	1000	20	WCW.TU.009.2006
Tiginox 316L	ER316L	2.4	1000	20	WCW.TU.009.2406
Tiginox 316L	ER316L	3.15	1000	20	WCW.TU.009.3156
Automig FC 71T-1	E71T-1C	1.2	-	15Kg Spool	WFC.ML.001.1202
Automig FC 71T-1	E71T-1C	1.6	-	15Kg Spool	WFC.ML.001.1602
Automig FC 71T-5	E71T-5C/M	1.2	-	15Kg Spool	WFC.ML.002.1202
Automig FC 71T-5	E71T-5C/M	1.6	-	15Kg Spool	WFC.ML.002.1602
Miginox FC 308L	E308LT1-1/4	1.2	-	12.5 Kg Spool	WFC.MX.002.1204
Miginox FC 308L	E308LT1-1/4	1.6	-	12.5 Kg Spool	WFC.MX.002.1604
Miginox FC 309L	E309LT1-1/4	1.2	-	12.5 Kg Spool	WFC.MX.004.1204
Miginox FC 309L	E309LT1-1/4	1.6	-	12.5 Kg Spool	WFC.MX.004.1604
Miginox FC 316L	E316LT1-1/4	1.2	-	12.5 Kg Spool	WFC.MX.020.1204
Miginox FC 316L	E316LT1-1/4	1.6	-	12.5 Kg Spool	WFC.MX.020.1604



ITEM CODE

CONTINUOUS WELDING CONSUMABLES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Automelt EL8	EL8	1.6	-	25 Kg Spool	WCW.SL.001.1603
Automelt EL8	EL8	2	-	25 Kg Spool	WCW.SL.001.2003
Automelt EL8	EL8	2.5	-	25 Kg Spool	WCW.SL.001.2503
Automelt EL8	EL8	3.15	-	25 Kg Spool	WCW.SL.001.3153
Automelt EL8	EL8	4	-	25 Kg Spool	WCW.SL.001.4003
Automelt EL8	EL8	5	-	25 Kg Spool	WCW.SL.001.5003
Automelt Gr A	EL8	2.5	-	25 Kg Spool	WCW.SL.009.2503
Automelt Gr A	EL8	3.15	-	25 Kg Spool	WCW.SL.009.3153
Automelt Gr A	EL8	4	-	25 Kg Spool	WCW.SL.009.4003
Automelt Gr A	EL8	5	-	25 Kg Spool	WCW.SL.009.5003
Automelt EM12K	EM12K	1.6	-	25 Kg Spool	WCW.SL.002.1603
Automelt EM12K	EM12K	2	-	25 Kg Spool	WCW.SL.002.2003
Automelt EM12K	EM12K	2.5	-	25 Kg Spool	WCW.SL.002.2503
Automelt EM12K	EM12K	3.15	-	25 Kg Spool	WCW.SL.002.3153
Automelt EM12K	EM12K	4	-	25 Kg Spool	WCW.SL.002.4003
Automelt EM12K	EM12K	5	-	25 Kg Spool	WCW.SL.002.5003
Automelt EH10K	EH10K	1.6	-	25 Kg Spool	WCW.SL.003.1603
Automelt EH10K	EH10K	2	-	25 Kg Spool	WCW.SL.003.2003
Automelt EH10K	EH10K	2.5	-	25 Kg Spool	WCW.SL.003.2503
Automelt EH10K	EH10K	3.15	-	25 Kg Spool	WCW.SL.003.3153
Automelt EH10K	EH10K	4	-	25 Kg Spool	WCW.SL.003.4003
Automelt EH10K	EH10K	5	-	25 Kg Spool	WCW.SL.003.5003
Automelt EH14	EH14	2	-	25 Kg Spool	WCW.SL.005.2003
Automelt EH14	EH14	2.5	-	25 Kg Spool	WCW.SL.005.2503
Automelt EH14	EH14	3.15	-	25 Kg Spool	WCW.SL.005.3153
Automelt EH14	EH14	4	-	25 Kg Spool	WCW.SL.005.4003
Automelt EH14	EH14	5	-	25 Kg Spool	WCW.SL.005.5003
Automelt EH11K	EH11K	1.6	-	25 Kg Spool	WCW.SL.016.1603
Automelt EH11K	EH11K	2	-	25 Kg Spool	WCW.SL.016.2003
Automelt EH11K	EH11K	2.5	-	25 Kg Spool	WCW.SL.016.2503
Automelt EH11K	EH11K	3.15	-	25 Kg Spool	WCW.SL.016.3153
Automelt EH11K	EH11K	4	-	25 Kg Spool	WCW.SL.016.4003
Automelt EH11K	EH11K	5	-	25 Kg Spool	WCW.SL.016.5003



ITEM CODE

CONTINUOS WELDING CONSUMABLES

Product Name	Classification	Diameter (mm)	Length (mm)	Net Wt.	Item Code
Automelt EA2	EA2	1.6	-	25 Kg Spool	WCW.SL.007.1603
Automelt EA2	EA2	2	-	25 Kg Spool	WCW.SL.007.2003
Automelt EA2	EA2	2.5	-	25 Kg Spool	WCW.SL.007.2503
Automelt EA2	EA2	3.15	-	25 Kg Spool	WCW.SL.007.3153
Automelt EA2	EA2	4	-	25 Kg Spool	WCW.SL.007.4003
Automelt EA2	EA2	5	-	25 Kg Spool	WCW.SL.007.5003
Automelt EA3	EA3	2	-	25 Kg Spool	WCW.SL.008.2003
Automelt EA3	EA3	2.5	-	25 Kg Spool	WCW.SL.008.2503
Automelt EA3	EA3	3.15	-	25 Kg Spool	WCW.SL.008.3153
Automelt EA3	EA3	4	-	25 Kg Spool	WCW.SL.008.4003
Automelt EA3	EA3	5	-	25 Kg Spool	WCW.SL.008.5003
Automelt EA4	EA4	2	-	25 Kg Spool	WCW.SL.022.2003
Automelt EA4	EA4	2.5	-	25 Kg Spool	WCW.SL.022.2503
Automelt EA4	EA4	3.15	-	25 Kg Spool	WCW.SL.022.3153
Automelt EA4	EA4	4	-	25 Kg Spool	WCW.SL.022.4003
Automelt EA4	EA4	5	-	25 Kg Spool	WCW.SL.022.5003
Automelt A55	-	-	-	30 kg Bag	WCF.AC.550.BA02
Automelt A57	-	-	-	30 kg Bag	WCF.AC.570.BA02
Automelt A82	-	-	-	30 kg Bag	WCF.AC.820.BA02
Automelt Gr IV	-	-	-	30 kg Bag	WCF.BS.040.BA02
Automelt B31	-	-	-	30 kg Bag	WCF.BS.310.BA02
Automelt B71	-	-	-	30 kg Bag	WCF.BS.710.BA02
Automelt B41	-	-	-	30 kg Bag	WCF.BS.410.BA02



Storage & Handling Instructions

Section IV



STORAGE & HANDLING INSTRUCTIONS

FOR WELDING CONSUMABLES

1. General Instructions:

Welding consumables will meet their required & specified properties, only when they are stored and handled as recommended by manufacturer.

Ador Welding Limited recommend to follow, the individual and validated technical rules, regulations, recommendations and standards, during transport, storage and handling.

Below are some general recommendations for storage and handling of welding consumables. They are applicable for all type of welding consumables.

- Mechanical damage and moisture pickup should be avoided at any cost
- Welding consumables should be stored in unopened and undamaged original packaging.
- The environment must be clean, dust-free and dry.
- Direct exposure to sunlight should be avoided.
- Open pallets should not be stacked.
- Direct contact of packaging with floor and walls should be avoided.
- Welding consumables should be stored frost free.
- Suitable measures must be taken to avoid temperature below due point.
- It is preferable to store the consumables in a chamber / room with relative humidity below 40%. This relative humidity can be achieved using dehumidifiers, electrical heaters, bulbs etc. The wall of room can suitably painted to maintain the humidity. The suitable dial –gauge meter can be used to measure the relative humidity continuously inside room.

These are all recommendations, they do not discharge user from his responsibility to ensure fault free condition of the welding consumable before use

2. Storage and Handling Instructions for SMAW Electrodes:

2.1 Scope:

SMAW Electrodes manufactured by Ador Welding Limited. Electrodes which are packed in:

- a. Cardboard Boxes – Primary and Secondary
- b. Pouches with Secondary cardboard box.
- c. Vacuum Pouches – R2U electrodes
- d. Hermetically sealed metal Tins
- e. Plastic Primary Cartons with Secondary cardboard box

Product Group	a	b	c	d	e
MSGP	√	-	-	-	-
C-Mn Steels	√	-	√	-	-
Cellulosic	√	-	-	√	-
Low Alloy Steel	√	-	√	-	-
Stainless Steel	-	√	-	-	-
Cast Iron	-	-	-	-	√
Hard Facing	√	-	-	-	-
Nickel Alloys	-	-	-	-	√
Copper Alloys	-	-	-	-	√
Aluminium Alloys	√	-	-	-	√
Cutting & Gouging Electrodes	√	-	-	-	-



STORAGE & HANDLING INSTRUCTIONS

FOR WELDING CONSUMABLES

2.2 Need:

Electrodes, when stored have tendency to pick up moisture. This tendency is more in case of low hydrogen electrodes as compared to rutile type electrodes. The flux coating on the electrodes absorbs moisture from atmosphere and if they are used subsequently, this moisture can result in porosity, hydrogen induced cracking etc. depending on amount of moisture absorbed. If electrodes are stored in a highly humid atmosphere, rusting of core wire of the electrodes can take place. All these can result in deterioration of mechanical properties of the weld metal.

2.3 Storage:

- a. The conditions to store electrodes in primary and/or secondary cardboard box are:
 - temperature 17-27°C, relative humidity max. 60%
 - temperature 27-37°C, relative humidity max. 50%.
 - Electrode boxes may be stored in layers to a maximum of 5.
- b. Above given Temperature & humidity requirements are not applicable for Vacuum Packs (R2U) and hermetically sealed packs, provided packs are not damaged and vacuum seal is unbroken.
- c. The storage period of the electrodes in cardboard boxes thus, should not exceed 3 years. Provision should be made to follow, first in first out principle to avoid aging.
- d. Electrodes in opened or damaged packs (of any type of packing) should be stored in a separate, heated chamber at higher temperature.

2.4 Handling:

Re-drying:

Re-drying is required for products in below given conditions:

- a. Rutile coated electrodes, being humidified for any reason
- b. Low hydrogen electrodes in cardboard boxes
- c. Low hydrogen electrodes, from damaged vacuum packs or which have remain unused after specified time
- d. Stainless steel electrodes
- e. Nickel based electrodes after long and unknown storage conditions
- f. For all above mentioned products if the storage conditions deviate.

Re-drying of electrodes:

- Proper re-drying temperature depends upon electrode type and its condition.
- Cellulosic electrode must not be re-dried.
- Rutile coated mild steel electrodes does not need re-drying unless they are humidified.
- Aluminium electrodes does not need re-drying.
- Follow re-drying cycle given in table 1 or on label or on product data sheets.
- Do not re-dry the electrodes at higher temperatures than recommended.
- Re-drying of electrode can be repeated maximum 3 times at max temperature & time specified.
- Do not stack more than 4 layers of electrodes in the re-drying oven.
- The re-drying temperature is the temperature in the bulk of the electrodes. The re-drying time is measured from the point at which the re-drying temperature has been reached.
- Vacuum packed electrodes, can be used upto 8 hrs after opening the pack subject to Temperature 35°C max and relative humidity of 90% max. This period can be extended to 12 Hrs under condition of temperature 27°C max and relative humidity of 70% max.



STORAGE & HANDLING INSTRUCTIONS

FOR WELDING CONSUMABLES

Table 1: Recommended Re-drying Cycle for various electrodes:

Electrode product group	Re-drying time (Hr)	Re-drying Temperature (°C)	Holding
Mild Steel – Rutile coated	0.5-2	80-120	10-20°C above ambient
Milds steel – Basic coated, low hydrogen	1-6	250-300	Holding oven at 100-150°C for max 1 year. Portable oven at 70-100°C for max 10 Hrs
Low Alloy Steel – Rutile coated	1-2	80-120	10-20°C above ambient
Low alloy steel – Basic coated	1-6	250-300	Holding oven at 100-150°C for max 1 year. Portable oven at 70-100°C for max 10 Hrs
Stainless Steel	1-6	250-300	Holding oven at 100-150°C for max 1 year. Portable oven at 70-100°C for max 10 Hrs
Cast Iron	1-6	120-150	Holding oven at 80-120°C for max 1 year.
Hard Facing – Rutile Coated	1-6	80-120	10-20°C above ambient
Hard Facing – Basic coated	1-6	250-300	Holding oven at 100-150°C for max 1 year. Portable oven at 70-100°C for max 10 Hrs
Ni alloys	1-6	250-300	
Cu Alloys	1-4	200-250	

2.5 Deteriorated products:

SMAW electrodes, that have suffered from serious water and moisture contamination, or have been exposed over long periods of time cannot be restored in their original conditions and should be discarded.

3. Storage and Handling of Solid wires and strips:

3.1 Scope:

Solid wires of GTAW, GMAW & SAW supplied in Tubes, Spools, bobbins & Drums. SAW & ESSC Strips supplied in Spools.

3.2 Storage:

Over and above general conditions, recommended storage conditions are:

- temperature 17-27°C, relative humidity max. 60%
- temperature 27-37°C, relative humidity max. 50%.

3.3 Handling:

In all conditions, while in use, opened and packed, wire & strip needs protection against contamination with moisture, dust, oil, etc.

During interruption of more than 8 hrs, the wire spool shall be stored in plastic bags in the above mentioned storage condition.

While welding with Aluminium wires, uniformity of air and metal temperature is important. Electrode and base metal should be allowed to stabilize before start of welding.

3.4 Deteriorated Products:

Wires and Strips that are oxidized (rusted), have suffered from serious water and moisture contamination, or have been exposed over long periods of time cannot be restored in their original conditions and should be discarded.



STORAGE & HANDLING INSTRUCTIONS

FOR WELDING CONSUMABLES

4. Storage and Handling Instructions for Cored Wires

4.1 Scope:

All the Flux Cored and Metal Cored wires of GMAW, GTAW and SAW processed packed in Tubes, Spools and Drums.

4.2 Storage:

Over and above general conditions, recommended storage conditions for cardboard box packed flux cored wire are:

- temperature 17-27°C, relative humidity max. 60%
- temperature 27-37°C, relative humidity max. 50%.

Above given Temperature & humidity requirements are not applicable for material supplied in Vacuum Packs, provided packs are not damaged and vacuum seal is unbroken.

4.3 Handling:

In all conditions, while in use, opened and packed, wire & strip needs protection against contamination with moisture, dust, oil, etc.

During interruption of more than 8 hrs, the wire spool shall be stored in plastic bags in the above mentioned storage condition.

Re-drying:

Flux cored wires exhibit porosity or worm tracks, when contaminated with moisture. Wire supplied on metal spools can may be re-dried at 120-150°C for 6-8 hrs. However, wire on plastic spools cannot be reconditioned.

4.4 Deteriorated Products:

Wires that are oxidized (rusted), have suffered from serious water and moisture contamination, or have been exposed over long periods of time cannot be restored in their original conditions and should be discarded.

5. Storage and Handling of Welding Flux:

5.1 Scope:

All types of SAW and ESSC Flux packed in Plastic Bags, Metal Drum and Vacuum Pouch.

5.2 Storage:

Over and above general conditions, recommended storage conditions for Welding flux packed in plastic bags are:

- temperature 17-27°C, relative humidity max. 60%
- temperature 27-37°C, relative humidity max. 50%.

Above given Temperature & humidity requirements are not applicable for material supplied in Vacuum Packs, provided packs are not damaged and vacuum seal is unbroken.

They are also not applicable to Flux packed in metal drums. Rusting and damage to the metal drums should be prevented.

5.3 Handling:

In all conditions, while in use, opened and packed, wire & strip needs protection against contamination with moisture, dust, oil, etc.

Re-drying:

Re-drying is required for products in below given conditions:

- a. All the agglomerated fluxes, supplied in plastic bags and metal drums
- b. Welding fluxes from damaged vacuum packs and which have remain unused after specified time



STORAGE & HANDLING INSTRUCTIONS

FOR WELDING CONSUMABLES

Re-drying Instructions:

- a. Re-drying for welding fluxes is to be carried out at 300-350°C for minimum of 2 Hrs.
- b. Do not re-dry the fluxes at higher temperatures than recommended.
- c. Re-drying of fluxes can be repeated maximum 3 times at max temperature & time specified.
- d. Holding temperature in SAW Fluxes depends on the thickness of flux layer kept for baking. 2 Hrs if holding time is applicable to 40mm thick flux layer. If the flux thickness in oven is higher than this, the holding time may be increased.
- e. The re-drying temperature is the temperature in the bulk of the flux. The re-drying time is measured from the point at which the re-drying temperature has been reached.
- f. After Re-drying, welding flux should be maintained in the oven at 120-150 Deg C continuously or transfer to Holding Oven as the case may be.
- g. Vacuum packed fluxes, can be used upto 8 hrs after opening the pack subject to Temperature 35°C max and relative humidity of 90% max. This period can be extended to 12 Hrs under condition of temperature 27°C max and relative humidity of 70% max.

5.4 Deteriorated products:

Welding Fluxes, that have suffered from serious water and moisture contamination, or have been exposed over long periods of time, or reduced to dust after reuse, cannot be restored in their original conditions and should be discarded.

5.5 Recycling of Fluxes:

- a. Unconsumed flux can be reused with addition of minimum 25% new flux.
- b. Unconsumed flux collected from the weld must be cleaned from slag, metal, and / or other contaminants.
- c. Damage to the flux by heavy impingement in the transportation system should be prevented.
- d. The agglomerated flux grains should not be segregated based on its size during usage of welding flux.

6. Shelf life for all welding consumables:

Shelf life for all consumables is **3 Years**, with one exception of all Aluminium consumables. They have shelf life of 1 Year. All the Vacuum Packed (R2U) Mild Steel and Low Alloy Steel electrodes have shelf life of 5 Years, if the Vacuum remains intact and the packs are handled carefully.

Individual products may have higher shelf life, but as formulas and / or standards might change, one should not extend shelf life. Take manufacturing date of product to calculate shelf life.





Safety Features

Section V



SAFETY FEATURES

IN WELDING

Welding is a safe operation when sufficient measures are taken to protect the welder from potential hazards. When these measures are overlooked or ignored, welders can encounter dangers such as electric shock, over exposure to fumes and gases, arc radiation, fire and explosion which may result in serious or even fatal injuries.

What is Personal Protective Equipment?

Personal Protective Equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical or other workplace hazards. PPE may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators or coveralls, vests and full body suits.

What can be done to ensure proper use of PPE ?

All PPE should be of safe design and construction and should be maintained in a clean and reliable fashion. It should fit well and be comfortable to wear, encouraging welder to use them.

Protective Clothing

Welder, must wear clothing to protect them from being burned. Injuries like burns are the most common due to sparks landing on bare skin. Welding arcs are very intense and can cause burns to skin and eyes with just a few minutes of exposure. Many types of clothing will protect you from ultra-violet radiation exposure, which appears as a skin burn (much like sunburn).

Under the worst conditions, severe burns and skin cancer may result from excessive radiation. Because of its durability and resistance to fire, wool clothing is suggested over synthetics (which should never be worn because it melts when exposed to extreme heat) or cotton, unless it is specially treated for fire protection.

If possible keep your clothes clean of grease and oil, as these substances may ignite and burn uncontrollably in the presence of oxygen. Other protective wear for heavy work or especially hazardous situations includes flame-resistant suits, aprons, leggings, leather sleeves/shoulder capes and caps worn under your helmet. Heavy flame-resistant gloves such as leather should always be worn to protect your hands from burns, cuts and scratches.

In addition, as long as they are dry and in good condition, they will offer some insulation against electric shock. In order to prevent electric shock, the key word is dry! When working in wet conditions or when perspiring heavily, you must be even more careful to insulate your body from electrically live parts and work on grounded metal.



Carrying out welding operations exposes the welder to Safety Hazards in following areas

1. Electric Shock
2. Electromagnetic Radiation
3. Fire & Explosion
4. Fumes & Gases
5. Heat

1. ELECTRIC SHOCK

Arc welding equipments operate at a voltage which is safe under normal working conditions but the shock hazard should not be ignored. It increases in warm & damp conditions because welder has to work with electric current which may pass through his body. The human body resistance to current passage is not constant. The highest resistance is offered by the skin. Wet skin conducts electric current better than dry skin under normal conditions.

Safety Precautions

- Check that equipment is correctly earthed when installed & when in use
- Make sure welding cables and machines are capable of handling maximum voltage & current as rated for the equipment & for the desired applications
- Check for damage to insulation on cables, holders, guns and connectors, please do not operate the equipment without properly insulating the same
- Ensure Arc welding machines are designed as per applicable standards
- Please operate equipments strictly as per printed Instructions and rules specified by respective original equipment manufacturers





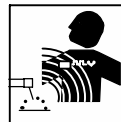
SAFETY FEATURES

IN WELDING

- Make sure all earthing connections are mechanically strong
- Ensure all welding equipments are inspected regularly
- Do not immerse hot electrode holder into water for cooling because retained moisture may give electric shock in later operations
- Do not carry holder and earthing together when welding machine is ON Always wear rubber soled safety shoes

2. ELECTROMAGNETIC RADIATION

The welding arc provides intense visible and invisible light (or radiation) and heat. Eyes must be protected from ultraviolet and infrared radiation to avoid Arc Eyes and Arc Burns. Light intensity of welding arc is 10,000 times that of the safe unit for human body. A welding arc should not be looked at with unprotected eyes. Failure to observe this rule may result in various degrees of eye burn or flashed eyes (Arc eyes). The affected person has pronounced irritations in the eyes and feels as if there is sand in the eyes. The symptoms remain for one to two days. Radiation effects are up to a distance of 15 meters.



Safety Precaution

- Do not look at welding arc with naked eyes
- Use heat - resisting quality of welding screen
- Use helmet or face shield fitted with the correct shade of filter glass
- Do not use cracked or defective helmets or shield
- If possible, coat individual welding booths with a mat & light absorbent type of paint with a very low reflecting quality
- Use safety clothing (safety shoes, leather hand gloves, leather apron, leather leggings and leather cap) when welding

3. FIRE & EXPLOSION

What is Fire?

When any material starts burning, we call it Fire.

Material (fuel) starts burning on application of heat in presence of air and oxygen.

Any fire requires three supports - fuel, oxygen and ignition, when these three meet proportionately with each other, then a fire breaks out.

When an outbreak of fire is discovered, immediate corrective action is essential to provide life and damage to property.



What is Explosion?

It is very rapid process of combustion, accompanied by rapid liberation of heat and formation of a very large volume of gases products.

Fire can be controlled by reducing Fuel or Heat of air.

Before extinguishing any fire, it is essential to know the classification of fire.

When material burns, it behaves in different manners, depending upon its physical properties. Extinguishing depends on these physical properties. Portable extinguishers are used in accordance with the extinguishing method.

Safety Precautions

- While repairing tanks, vessels, drums or pipes by welding or gas cutting, remove all traces of earlier stored material to avoid possibility of explosion
- Remove all flammable materials from working areas
- Avoid excessive release of fuel gas into the atmosphere
- Ensure that appropriate fire fighting equipment is available at hand and that all concerned know how to use it
- Have a bucket of water at the work station for cooling overheated blow pipes
- Where a 'Permitted to work' system is in operation, ensure that all instructions are fully complied with
- Check emergency escape route



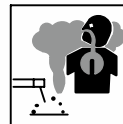
SAFETY FEATURES

IN WELDING

4. FUMES & GASES

Proper ventilation is a must to maintain good health. It is true that when a welder gets clean air to breathe, he can see better, work better, work longer, quality of his work improves & productivity of people working nearby increases in an improved environment.

Most common toxic fumes are from materials such as Zinc Oxide, Carbon Monoxide, Mercury, Lead and Cadmium



Safety Precautions

- Carry out all welding operations in safe, clean and at location where sufficient natural air circulation is available.
- Under normal workshop conditions, use a local fume extractor wherever possible and maintain its position close to the weld as work progresses
- Check for possible toxic hazards from parent metal (especially if surface is painted, plated or chemically treated) or from welding consumables
- Check for adequate ventilation and/or breathing apparatus when welding in an enclosed space
- Use a face respirator when toxic fumes are present

5. HEAT

Heat & Spatter are expelled during cutting and welding. The work piece will remain hot for some time after welding.

Safety Precautions

- Wear correct protective clothing in good condition, free from grease and oil
- Treat all metal connected with welding and cutting as HOT
- Mark work piece as HOT when it is hot (remove notice when cool)





ADOR WELDING LIMITED

Corporate Marketing Office: Survey No. 147/2B+3, Akurdi, Near Khandoba Mandir, Chinchwad, Pune - 411 019, Maharashtra, India.

☎ 1800 233 1071

✉ care@adorians.com

☎ +91 20 40706000



www.adorwelding.com